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Vol. 978 Number 1

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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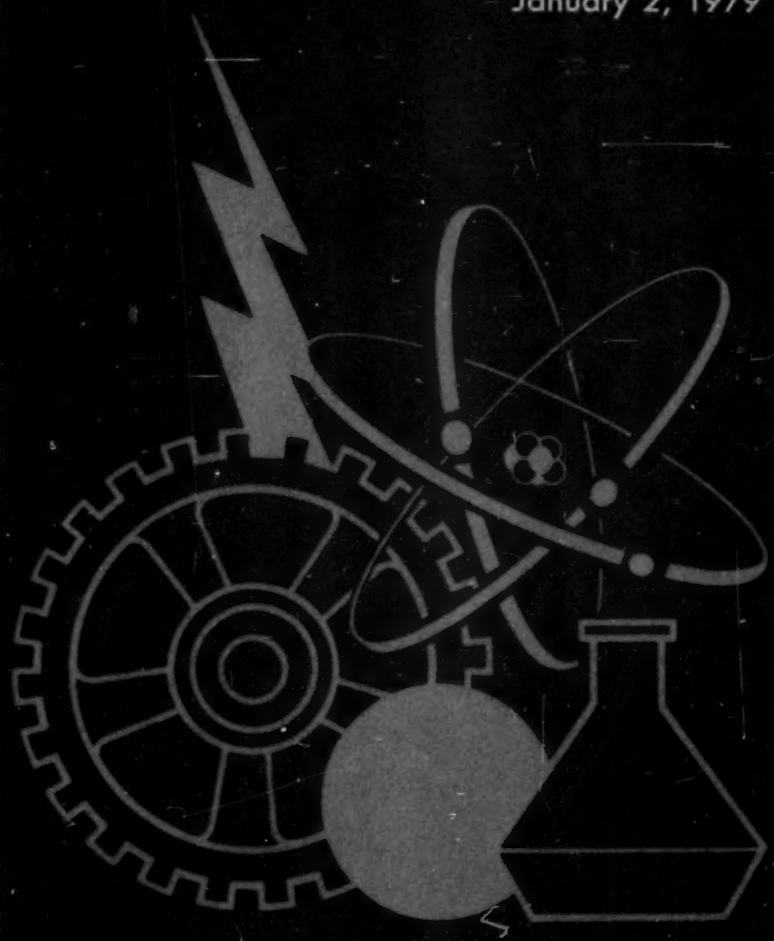
January 2, 1979



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PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

January 2, 1979 Volume 978 Number 1

CONTENTS

	Page
Consolidated Listing of Recent Official Gazette Notices—Re Patent and Trademark Office Practices and Procedures	978 OG 3
Patent and Trademark Notices	
Patent Cooperation Treaty (PCT) Information	978 OG 135
National Inventors Day	978 OG 135
Reissue Applications Filed	978 OG 135
Patent Notices	
Certificates of Correction for the Week of January 2, 1979	978 OG 136
Disclaimers	978 OG 136
Disclaimer and Dedication	978 OG 136
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	978 OG 137
Condition of Patent Applications	978 OG 138
Defensive Publications (T978,001)	1
Reissue Patents Granted (29,872)	3
Plant Patents Granted (4,360)	5
Patents Granted	
General and Mechanical (4,131,952)	7
Chemical (4,132,522)	201
Electrical (4,132,852)	293
Design Patents Granted (250,676)	361
Index of Patentees	PI 1
Indices of Applicants of Defensive Publications, Reissues, Plants and Designs	PI 37
Classification of	
Patents (Including Reissues)	PI 39
Designs, Plants and Defensive Publications	PI 41
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 42
Designs, Plants and Applicants of Defensive Publications	PI 43
Change of Address Form and Subscription Order Form	Back Page

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Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

CONSOLIDATED LISTING OF RECENT OFFICIAL GAZETTE NOTICES RE PATENT AND TRADEMARK OFFICE PRACTICES AND PROCEDURES

PATENT NOTICES

The following is a compilation of the more important notices and rule changes which have been published in the OFFICIAL GAZETTE *from July 1, 1964, through December 31, 1978. These notices and rule changes are currently in effect unless otherwise noted.*

INFORMATION AND CORRESPONDENCE

(1) OFFICIAL PATENT OFFICE MAILING ADDRESS REMAINS WASHINGTON, D.C.

The official mailing address for all communications sent to the Patent Office remains:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

Any telegrams sent to the Patent Office must also bear the above identical address.

The physical location of the Patent Office is 2021 Jefferson Davis Highway, Arlington, Virginia. This address must not be used when addressing mail to the Patent Office.

No reference to Crystal Plaza, Virginia, should be made in the address of *any* communication intended for delivery to the Patent Office by the Post Office Department or Western Union.

Compliance with this instruction will help prevent any unnecessary delay in the delivery of mail, telegrams, etc.

C. A. KALK,
Feb. 20, 1969. *Director of Administration.*

(Office name change per Public Law 93-596, Jan. 2, 1975)

[860 O.G. 662]

(2) GROUP NUMBER SHOULD APPEAR ON COMMUNICATIONS RELATING TO PENDING APPLICATIONS

It is again requested that the Group number be typed on amendments and other communications relating to pending applications in order to expedite the handling of mail and to conserve manpower. The number of the Group should be placed on the right-hand side, opposite the Serial Number or name of applicant. In view of the vast amount of mail, continued careful attention to these details will do much toward avoiding delay in handling of mail.

C. A. KALK,
Nov. 6, 1969. *Director of Administration.*

[869 O.G. 345]

(3) IDENTIFICATION FOR APPLICATION CORRESPONDENCE

The Office is continuing to experience difficulty in matching incoming papers with the corresponding application files. This applies especially to responses to Office Actions, powers of attorney, changes of address, status letters, requests for extensions of time, and petitions.

A very necessary part of a complete identification of a pending application is the three-digit Group or Art Unit number, e.g., 110 or 111. Frequently, the Group Art Unit number is entirely omitted, or there are errors in this number. In the latter situation the error often occurs as a result of the case having been reassigned within the Office, and the communication is directed to an Examining Group other than that indicated in the most recent Office Action.

Where the Group Art Unit number is entirely omitted, the routine operations of the Application Branch must be interrupted solely for the purpose of determining the location of the application so that the communication can be properly routed. Under these circumstances the efficiency of the Application Branch is impaired and the incoming paper is delayed in reaching its proper destination. Where such papers are not essential to compliance with a statutory period or time limit for response, they may be returned for completion to identify the location of the files.

To assist the Office in expediting its business, it is requested that ALL papers relating to a pending application include the following information:

1. Serial number (checked for accuracy),
2. Group Art Unit number (copied from filing receipt or most recent Office Action),
3. Filing date,
4. Name of the Examiner who prepared the most recent Office Action.
5. Title of the invention.

To further reduce the burden on the Application Branch and the Examining Groups, it is also requested that the submission of additional or supplemental papers on a newly filed application be deferred until a filing receipt has been received. In the same vein, it would be appreciated if the filing of additional papers, relating to an allowed application were deferred until a notice of allowance (POL-85) was received.

If the above suggestions are adopted the processing of both new and allowed applications could proceed more efficiently and promptly through the Patent Office.

RICHARD A. WAHL,
Mar. 5, 1971. *Assistant Commissioner.*

[885 O.G. 2]

(4) IDENTIFYING APPLICATION CORRESPONDENCE WITH ISSUE BATCH NUMBER

Applicants or their attorney or agent can facilitate matching incoming papers with the corresponding application file by indicating the Issue Batch Number on all papers filed in the Office after receiving the Notice of Allowance and before the time the Issue Fee Receipt is received.

The Issue Batch Number is printed on the Notice of Allowance form in Box 4 in the lower left-hand corner below the address. The Issue Batch Number consists of a capital letter followed by two digits, for example; "A03," "D18," "F42," "J79." Any lower case letters before the Issue Batch Number should be ignored since they are the typist's initials. Use of the Issue Batch Numbers is important since the allowed applications are filed by these numbers.

Any paper filed after receiving the Issue Fee Receipt should include the indicated patent number rather than the Issue Batch Number. At this time in the processing, the Issue Batch Number is no longer useful since the application has been removed from the batch at the time the patent number was assigned.

RICHARD J. SHAKMAN,
Jan. 16, 1976. *Assistant Commissioner for Administration.*

[943 O.G. 519]

(5) HAND DELIVERY OF PAPERS

The notices of November 10, 1969 (869 O.G. 345) and September 8, 1970 (879 O.G. 667), regarding "Hand Delivery of Papers," are superseded and the practice indicated below is hereby made effective.

Any paper which relates to a pending application may be personally delivered to an Examining Group. However, the Examining Group will accept the paper only if: (1) the paper is accompanied by some form of receipt which can be handed back to the person delivering the paper; and (2) the Examin-

ing Group being asked to receive the paper is responsible for acting on the paper.

The receipt may take the form of a duplicate copy of such paper or a card identifying the paper. The identifying data on the card should be so complete as to leave no uncertainty as to the paper filed. For example, the card should contain the applicant's name(s), Serial No., filing date and a description of the paper being filed. If more than one paper is being filed for the same application, the card should contain a description of each paper or item.

Under this procedure, the paper and receipt will be date stamped with the Group date stamp. The receipt will be handed back to the person hand delivering the paper. The paper will be correlated with the application and made an official paper in the file, thereby avoiding the necessity of processing and forwarding the paper to the Examining Group via the Mail Room.

The Examining Group will accept and date stamp a paper even though the paper is accompanied by a check or the paper contains an authorization to charge a Deposit Account. However, in such an instance, the paper will be hand carried by Group personnel to the Office of Finance for processing and then made an official paper in the file.

WILLIAM FELDMAN,
Jan. 29, 1974. *Deputy Assistant Commissioner for Patents.*

[919 O.G. 1070]

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(6) POST CARD RECEIPT REMINDER

Applicants and their attorneys or agents are reminded of the provision in Section 717.01(a) (now Section 503) of the Manual of Patent Examining Procedure relating to the use of post cards as "receipts" of papers filed in the Patent Office.

If a receipt for any paper filed in the Patent Office is desired, it may be had by enclosing with the paper a self-addressed post card identifying the paper. The Patent Office will stamp the receipt date on the card and place it in the outgoing mail.

The identifying data on the card should be so complete as to match the paper with the application or other document to which it is to be associated. For example, the document should be identified by the applicant's name(s), Serial No., filing date, appeal number, interference number, etc., and the paper should be identified by specifying the type thereof, viz, affidavit, amendment, appeal, application papers, brief, drawings, fees, motions, supplemental oath or declaration, petition, etc.

When papers for more than one document are filed under a single cover a return post card should be attached to the paper for *each* document for which a receipt is desired.

RICHARD A. WAHL,
Nov. 21, 1968. *Assistant Commissioner.*

[857 O.G. 667]

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(7) STATUS INQUIRIES

In an effort to sharply reduce the volume and need for status inquiries, the past policy that diligence must be established by making timely status requests in connection with petitions to revive is hereby discontinued.

When an application has been abandoned for an excessive period before the filing of a petition to revive, an appropriate terminal disclaimer may be required. It should also be recognized that a petition to revive must be accompanied by the proposed response unless it has been previously filed (Rule 137). Also, under Rule 113, "Response to a final rejection or action must include cancellation of, or appeal from the rejection of, each claim so rejected and, if any claim stands allowed, compliance with any requirement or objection as to form."

New Applications

Current examining procedures now provide for the routine mailing from the Examining Groups of Form POL–327 in *every* case of allowance of an application except where an Examiner's Amendment is promptly mailed. Thus, the separate mailing of a Form POL–327 or an Examiner's Amendment in addition to a formal Notice of Allowance (POL–85) in all allowed cases would seem to obviate the need for status inquiries even as a precautionary measure where the applicant may believe his new application may have been passed to issue on the first examination. However, as an exception, a status inquiry would be appropriate where a Notice of Allowance is not received within three months from receipt of either a Form POL–327 or an Examiner's Amendment.

Current examining procedures also aim to minimize the spread in dates among the various examiner dockets of each Art Unit and Group with respect to actions on new applications. Accordingly, the dates of the "oldest new applications" appearing in the OFFICIAL GAZETTE are fairly reliable guides as to the expected time frames of when the Examiners reach the cases for action.

Therefore, it should be rarely necessary to query the status of a new application.

Amended Applications

Amended cases are expected to be taken up by the examiner and an action completed within two months of the amendment date. Accordingly, a status inquiry is not in order after response by the attorney until five or six months have elapsed with no response from the Patent Office. A post card receipt for responses to Office actions, adequately and specifically identifying the papers filed, will be considered *prima facie* proof of receipt of such papers. Where such proof indicates the timely filing of a response, the submission of a copy of the post card with a copy of the response will ordinarily obviate the need for a petition to revive. Proof of receipt of a timely response to a final action will obviate the need for a petition to revive only if the response was in compliance with Rule 113.

In General

It is expected that this new policy will result in sharply reducing the number of status inquiries and permit the time now spent on them to be used in increasing Patent Office efficiency in other more essential areas.

Such status inquiries as may be still necessary may be more expeditiously processed by the Patent Office if each inquiry includes the application Serial Number, filing date, name of the applicant, name of the Examiner who prepared the most recent Office action, and Group Art Unit (taken from the most recent Office communication) in addition to the last known status of the application, and is accompanied by a stamped return-addressed envelope. Telephone inquiries regarding the status of applications should be directed to the group clerical personnel and not to the examiners. Inasmuch as the official records and applications are located in the clerical section of the Examining Groups, the clerical personnel can readily provide status information without consulting the examiners.

Status replies will be made by the Patent Office clerical support force and will only indicate whether the application is awaiting action by the Examiner or the applicant's response to an Office action. In the latter instance the mailing date of the Office action will also be given.

The Notices of Dec. 5, 1969 (869 O.G. 1031) and Sept. 22, 1965 (819 O.G. 444) are hereby superseded.

RICHARD A. WAHL,
Nov. 24, 1971. *Assistant Commissioner of Patents.*

[893 O.G. 810]

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(8) CHANGE OF ADDRESS

There recently has been an increased incidence in the number of applications suffering from disruptions in communications stemming from failure to notify the Patent and Trademark Office of a change of address on the part of applicant's representative (attorney or agent of record) in each application wherein he holds an active power of attorney. Applications have become abandoned as a result of an Office action being mailed to the old, uncorrected address and thereby failing to reach the representative at his new address sufficiently early to permit him to file a timely response. Accordingly, the requirement set out below is published as a reminder and is designed to ameliorate this problem.

Where an attorney or agent of record (or applicant, if he is prosecuting his application pro se) changes his correspondence address, he is responsible for promptly notifying the Patent and Trademark Office of his new correspondence address (including ZIP code number). A separate notification must be filed in *each application* for which he is intended to receive communications from the Office. The notification should also include his telephone number.

While the notification need take no particular form, it should be provided in a manner calling attention to the fact that a change of address is being made. Thus, the mere inclusion, in a paper being filed for another purpose, of an address different from the previously provided correspondence address, without mention of the fact that an address change is being made, would not ordinarily be recognized or deemed as instructions to change the address on the file record.

It is emphasized that the above-delineated responsibility is *additional* to the separate obligation (see 37 CFR 1.347) of a registered attorney or agent to notify the Attorney's Roster of any change of his address for entry on the register, which must be done in a letter separate from any notice of change of address filed in individual applications. That obligation continues without change.

The degree of care exercised in adhering to the foregoing requirement for notification of change of address in each concerned application will be a factor for consideration in deciding petitions filed under 37 CFR 1.137 to revive applications which have become abandoned because of a failure to timely receive an Office action addressed to the old address. In such instances, the showing of the cause of unavoidable delay must include an adequate showing that a timely notification of the change of address was filed in the concerned application, in a manner reasonably calculated to call attention to the fact that it was a change of address. If no such notification was made, or was made belatedly, the showing must include an adequate explanation of that failure or delay. A showing that notification was made on a paper filed in the Patent and Trademark Office listing *plural* applications as being affected will not be considered a proper notification.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

May 28, 1975.

[935 O.G. 1352]

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(9) CHANGE OF ADDRESS OR PRACTITIONER IN A PLURALITY OF PATENT APPLICATIONS

Change of Address

This notice is supplemental to the Notice of May 28, 1975, 935 O.G. 1352.

In those instances where a change in the correspondence address of a registered attorney or agent is necessary in a plurality of applications, and the number of applications is such as to cause undue hardship, the notification filed in each application may be a reproduction of a properly executed, original notification. The original notice may be sent to the Office of the Solicitor as notification to the Attorney's Roster of the change of address, or may be filed in one of the applications affected, provided that the notice includes an authorization for the public to inspect and copy the original notice in the event one of the applications containing a copy matures into a patent and the application containing the original paper is either pending or has become abandoned. The copies submitted in each affected application must identify where the original paper is located. Otherwise, the practice governing the filing of notifications of change of address remains the same.

Powers of Attorney

In the event of a need to file a change in the power of attorney in a plurality of applications of a common assignee or inventive entity, and the number of applications is such as to cause undue hardship, a single, original paper may be used provided that a reproduction of this original paper is supplied in each of the affected applications. The copy of the original paper must identify in which application the original paper is located and authorize the public to inspect and copy the original paper in the event one of the applications containing a copy matures into a patent and the application containing the original paper is pending or has become abandoned. The procedures and usual prerequisites for the filing of grants and/or revocations of power of attorney otherwise remain the same.

WILLIAM FELDMAN,
Sept. 9, 1976. *Deputy Assistant Commissioner for Patents.*

[951 O.G. 454]

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(10) ACCESS TO PATENT APPLICATION AND INTERFERENCE FILES

In order to insure that access to patent application and interference files is given only to persons who are entitled thereto or who are specially authorized to have access under Rule 14 of the Rules of Practice in Patent Cases, and to insure also that the file record identifies any such specially authorized person who has been given access to a file, the following practice will be observed by all personnel of the Patent Office:

1. Access, as provided for in the Rules of Practice, will be given on *oral request* to any applicant, patentee, assignee, or attorney or agent of record in an application or patent only upon *proof of identity* or upon *recognition* based on personal acquaintance.
2. Where a power of attorney or authorization of agent was given to a registered firm prior to July 2, 1971, access will be given upon oral request as in paragraph 1 above to any registered member or employee of the firm who has signatory power for the firm.
3. Unregistered employees of attorneys or agents, public stenographers, and all other persons not within the provisions of paragraphs 1 and 2 above will be given access only upon presentation of a *written authorization for access* signed by a person specified in paragraph 1 above, which authorization will be entered as a part of the official file.

ROBERT GOTTSCHALK,
Nov. 24, 1971. *Acting Commissioner of Patents.*

[893 O.G. 810]

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(11) EXPRESS MAIL

This notice is in response to a number of inquiries received in the Patent and Trademark Office regarding the notice on Express Mail of February 11, 1975, published in the OFFICIAL GAZETTE of March 11, 1975 (932 O.G. 340).

There are two types of Express Mail delivery offered by the U.S. Postal Service—"Post Office to Addressee" and "Post Office to Post Office." The only type of service which can be used for Express Mail directed to the Patent and Trademark Office is "Post Office to Addressee." This service provides for delivery to one of our employees in Room 1627, Department of Commerce Building, Washington, D.C., no later than 3:00 p.m. of the next workday following its deposit before 5:00 p.m. at any postal facility with an Express Mail window.

The only address that should be used for Express Mail sent to the Patent and Trademark Office is:

"Commissioner of Patents and Trademarks
Washington, D.C. 20231."

"Post Office to Post Office" Express Mail *does not* provide for delivery but instead is retained at the postal facility of the addressee for pickup. The Postal Service *does not* notify the addressee that this type of Express Mail has been received and is awaiting pickup. If not picked up, this mail is held for 15 days and then returned to the sender.

Therefore, since the Patent and Trademark Office does not have resources for picking up any mail, including Express Mail, the "Post Office to Post Office" Express Mail will not reach the Patent and Trademark Office.

WILLIAM I. MERKIN,
Acting Assistant Commissioner for Administration.

May 15, 1975.

[936 O.G. 1554]

(12) CERTIFICATE OF MAILING PROCEDURES

On November 1, 1976, the Patent and Trademark Office instituted the Certificate of Mailing Procedure by promulgating 37 CFR 1.8 in an attempt to reduce the number of problems resulting from late receipt of responses due to mail delays. This notice was published in the OFFICIAL GAZETTE on October 26, 1976 (951 O.G. 1342 and TM 210). Guidelines relative to this procedure were published in the OFFICIAL GAZETTE on November 16, 1976 (952 O.G. 918 and TM 174).

Although the new procedure has gained wide acceptance, it has not been entirely without problems. One major problem involves the correlation of the certification with the appropriate papers when presented on a separate sheet. In order to curtail this problem and other minor ones, the guidelines published on November 16, 1976, are superseded by the following guidelines. They are applicable to responses in both patent and trademark matters, as permitted by 37 CFR 1.8.

Guidelines

A) The certification requires a signature. Specifically, if the certification appears on a paper that requires a signature, two signatures are required, one for the paper and one for the certification. Although not specifically required by 37 CFR 1.8, it is preferred that the certificate be signed by the applicant, assignee, or registered practitioner.

B) When possible, the certification should appear on a portion of the paper being submitted. However, if there is insufficient space to make the certification on the same paper, such as in the case of the patent issue fee transmittal form PTO–85, the certification should be on a separate sheet securely attached to the paper.

C) When the certification is presented on a separate sheet, that sheet must (1) be signed and (2) fully identify and be securely attached to the paper it accompanies. The required identification should include the serial number and filing date of the application as well as the type of paper being filed, e.g., responses to rejection or refusal, Notice of Appeal, etc. An unsigned certification will not be considered acceptable.

Moreover, without the proper identifying data, a certification presented on a separate sheet will not be considered acceptable if there is any question or doubt concerning the connection between the sheet and the paper filed.

If the sheet should become detached from the paper and thereafter not associated with the appropriate file, evidence that this sheet was received in the Office can be supported by submitting a copy of a post card receipt specifically identifying this sheet and the paper and by submitting a copy of the sheet as originally mailed. Attention is directed to the notice of November 21, 1968 published in the OFFICIAL GAZETTE (857 O.G. 667) relative to the use of post cards as receipts.

D) In situations wherein the correspondence includes papers for more than one application (e.g., a single envelope containing separate papers responding to Office actions in different applications) or papers for various parts of the Office (e.g., a patent issue fee transmittal form PTO–85 and an assignment), each paper must have its own certification as a part thereof or attached thereto.

E) In situations wherein the correspondence includes several papers directed to the same application (e.g., a proposed response under 37 CFR 1.116 and a Notice of Appeal), each paper should have its own certification as a part thereof or attached thereto.

Use of Stamped Certification

Some practitioners are placing the certification language on the first page of a paper with an inked stamp. Such a practice is encouraged because the certification is not only readily visible but also forms an integral part of the paper. An example of a preferred stamp is:

> I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on _____
> (Date of Deposit)
> _____
> Name of applicant, assignee, or Registered Representative
> _____
> Signature
> _____
> Date of Signature

Interpretations

The phrase "prior to expiration of the set period" in 37 CFR 1.8(a) includes the last day of the set period, which last day may be the "next succeeding secular or business day" as set out in 35 U.S.C. 21. Also, the filing of a 37 CFR 3.54 form to effect a filing under 37 CFR 1.60 is considered the filing of an application and is, therefore, excluded from the Certification of Mailing Procedure.

C. MARSHALL DANN,
Aug. 30, 1977. *Commissioner of Patent and Trademarks.*

[962 O.G. 20]

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(13) SUBSTITUTE POWERS OF ATTORNEY

The Patent and Trademark Office has recently received correspondence in certain applications under the title "Substitute Power of Attorney" wherein the principal attorney of record attempted to name other attorneys as his substitute in those applications.

Since the power of the principal attorney may be revoked, or terminated as by his death, revocation or termination of said power of the principal attorney will also terminate the power of those appointed by him. Thus, a principal attorney may appoint an associate attorney whose power terminates with that of the principal, but he may not appoint a "substitute" and any attempt by the principal to appoint a "substitute" attorney whose power survives his own shall not be recognized by the Office.

WILLIAM FELDMAN,
Dec. 17, 1975. *Deputy Assistant Commissioner for Patents.*

[942 O.G. 1074]

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(14) CHANGE IN LEGAL HOLIDAYS

Those doing business before the Patent Office are hereby reminded that by Public Law 90—363, 82 Stat. 250, effective January 1, 1971, Section 6103(a) of Title 5, United States Code, was amended to read as follows:

§ 6103. *Holidays*

(a) The following are legal public holidays:
New Year's Day, January 1.
Washington's Birthday, the third Monday in February.
Memorial Day, the last Monday in May.
Independence Day, July 4.
Labor Day, the first Monday in September.
Columbus Day, the second Monday in October.
Veterans Day, the fourth Monday in October.
Thanksgiving Day, the fourth Thursday in November.
Christmas Day, December 25.

Each of the holidays enumerated will constitute "a holiday within the District of Columbia," as referred to in Section 21, Title 35, United States Code.

WILLIAM E. SCHUYLER, JR.,
Dec. 2, 1970. *Commissioner of Patents.*

[881 O.G. 1707]

EDITORIAL NOTE: Sec. 6103(c) states that January 20 of each fourth year after 1965, Inauguration Day, is also a legal public holiday.

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(15) RELOCATION OF CUSTOMER RELATIONS CENTER

In order to expand facilities in the Public Search Room of the Patent and Trademark Office, it has become necessary to relocate the Customer Relations Center.

As of January 19, 1976, the Center was moved to Building No. 2, Room 4C08. The telephone number of the Center will continue to be (703) 557–2003.

WILLIAM I. MERKIN,
January 1976. *Acting Assistant Commissioner for Administration.*

[943 O.G. 519]

(16) AVAILABILITY OF PATENT APPLICATION DRAWINGS FOR REPRODUCTION

Clients of private commercial reproduction services requesting patent application drawings to make drawing reproductions for U.S. and foreign filings have caused printing problems and delays in allowed applications in which the Base Issue Fee has been paid.

In order to prevent any delay in the printing and issuance of applications in which the Base Issue Fee has been paid, access to the drawings of patent applications which have been scheduled for printing will not be normally available. Delays in obtaining patent application drawings by commercial reproduction services, after the application has been scheduled for printing, can be avoided if requests for reproductions are made either before or promptly after receipt of the Notice of Allowance and prior to the payment of the Base Issue Fee.

WILLIAM I. MERKIN,
Acting Assistant Commissioner for Administration.
May 6, 1975.

[934 O.G. 1324]

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(17) ACCEPTABLE DRAWINGS FOR PATENTS

Approximately ten years ago, the Office's standards for acceptable drawings with respect to certain matters including the blackness and minimum thickness of inked lines, and shading of drawings, were relaxed in order to reduce the backlog of informal drawings at that time.

Apparently, because of the increased use of pens with a round, open-end capillary tip in place of the conventional draftsman's drawing pen, the Office now has a problem of obtaining acceptable reproduction copies of thin, light and gray lines which appear on many drawings. As a result, approximately 10,000 drawings sheets filed each year are *not* acceptable for normal reproduction and microfilming from the printed copy. Special printing steps must be taken to try to print very thin or light lines. Inked lines should be at least 0.012 inch in width and no closer together than 0.05 inch. Shading lines should be constructed to meet these criteria for acceptable drawings. The inked lines must not rub off the standard bristol board sheet, and their reflectance should not exceed 12%.

Applicants and draftsmen are requested not to use thin or light lines on their drawings. In the future, drawing requirements will be more stringent regarding the blackness and minimum thickness of lines to be acceptable. The Chief Draftsman has been instructed to adhere strictly to the above standards and criteria after January 1, 1978 so that special printing requirements can be held to a minimum.

Persons interested in examples of acceptable and unacceptable lines for drawings may obtain one set of "Printed Examples from Unacceptably Inked Drawings" by writing to:

The Chief Draftsman
U.S. Patent and Trademark Office
Washington, D.C. 20231

RICHARD J. SHAKMAN,
Oct. 20, 1977. *Assistant Commissioner for Administration.*

[964 O.G. 21]

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(18) PUBLIC SEARCH ROOM FOR PATENTS

Establishment of New Procedures and Revisions of Regulations

One of the major obligations of the Patent and Trademark Office is to make patent information available for public inspection. The quality of this service depends upon promoting an environment conducive to research and maintaining the integrity of the files in the Public Search Room for Patents.

To emphasize our commitment to providing this environment with complete and orderly files for public use, the Patent and Trademark Office is establishing new procedures and revising the Regulations for using the facilities of the Public Search Room for Patents. The new procedures and revised Regulations will become effective August 23, 1976. The new procedures for the Search Room include the requirement that users obtain and show, prior to entering the Search Room facilities, a User Pass. This pass can be obtained at a special desk near the guard station. User Passes will be issued to persons not under prohibition from using the search facilities who agree to abide by the Regulations of the Public Search Room for Patents by signing a statement to that effect. User Passes are non-transferable and are valid until reissue or revocation for cause.

The new procedures also include the requirement that persons entering and exiting the Search Room use designated lanes. Persons exiting the Search Room will automatically pass electronic sensing equipment designed to detect any marked documents or materials being removed from the Search Room. The sensing equipment is capable of detecting marked documents and materials in briefcases and parcels and under clothing. The equipment does not use X-ray or other high energy radiation and is, therefore, completely safe and harmless to persons, photographic film, magnetic tape and electronic or mechanical devices such as wristwatches. The Patent and Trademark Office is now preparing older documents in the Classified and Application files for use under this system. All new patents are marked for sensing before being placed in the Classified files.

Whenever a marked document is transported past the sensing equipment, Patent and Trademark Office officials and the security guards will be alerted to the removal of the document, and a gate on the exit lane will lock. Persons triggering the alarm will be asked to cooperate in identifying the source for the alarm. Failure to cooperate when the alarm is triggered could result in detention of the person, seizure of any briefcase or the like, or other legal measures deemed necessary and appropriate in the specific case.

In order to assure that the changes in the Search Room fully apply to the Record Room, the entrance to the Record Room will be relocated within the Search Room. This change is currently under way.

The revised Regulations for the Search Room appear below, and a reprinting of the Regulations brochure incorporating the revisions will soon be available in the Search Room. The substance of the changes in the procedures and the revised Regulations for the Search Room, as well as any pertinent information that will assist users in the changeover, will be prominently posted in the Search Room. In order to maintain an environment conducive to research, the revised Regulations will be strictly enforced.

Although these new procedures and revised Regulations may cause some inconvenience, it is hoped that with your understanding and cooperation they will result in improvement in search facilities which will benefit all participants in our patent system.

REGULATIONS FOR THE PUBLIC USE OF RECORDS IN THE PUBLIC SEARCH ROOM FOR PATENTS OF THE PATENT AND TRADEMARK OFFICE

The Public Search Room for Patents is defined as that area comprising the foyers off the lobbies of Buildings 3 and 4 of Crystal Plaza; the offices, Microfilm Center, restrooms and telephone areas off these foyers; the stacks, Record Room, study and copier areas between the foyers; and the Mezzanine.

Under applicable statutes and regulations, including 49 U.S.C. 486(c); 41 CFR Subpart 101–20.3 and appropriate Sections of Department Organization Orders 30–3A and 30–3B of the Department of Commerce, the regulations appearing below are established for those using the facilities of the Public Search Room for Patents.

1. All persons using these facilities are subject to the regulations governing conduct on Federal Property, as specified in 41 CFR Subpart 101–20.3.
2. All posted Official Notices are to be complied with.
3. Smoking is not permitted except in designated areas.
4. Food and beverages in any form are not to be consumed except in designated areas.
5. Loud talking, use of radios, or any other form of activity which may disturb other members of the public is forbidden.
6. Children brought into the Public Search Room for Patents must not be allowed to disturb others.

7. Users of the facilities may not give the Patent and Trademark Office as a mailing address or otherwise suggest that mail may be received at the Patent and Trademark Office; nor may correspondence be conducted on official Patent and Trademark Office stationery.
8. Messages shall not be affixed to walls, desks, phone booths, or other public property, except designated message boards.
9. Patents and records shall not be removed from the facilities without proper authorization; nor shall they be mutilated. The unlawful removal or mutilation of records is forbidden by law and is punishable by fine or imprisonment or both (18 U.S.C. 2071).
10. The presence or use of equipment such as reproducing machines, typewriters and photographic equipment is prohibited without prior permission. The use of dictating equipment is prohibited, except in designated areas.
11. Library trucks or carts are to be used for transporting bundles only. They are not to be used for storage while making searches.
12. Patents temporarily removed from bundles for copying must be replaced promptly.
13. All bundles of patents must be promptly replaced in the stacks by the user.
14. The reserving of seats and/or working areas is prohibited.
15. Users of the Public Search Room for Patents are not permitted to use Patent and Trademark Office facilities beyond the Search Room after 5:00 p.m.
16. The front portion of the Public Search Room for Patents, i.e., that portion facing Crystal Plaza Drive and having a high ceiling, shall not be occupied by users after 6:00 p.m.
17. A valid User Pass must be shown upon request to authorized Patent and Trademark Office personnel.
18. User Passes are nontransferable and must be surrendered to authorized Patent and Trademark Office personnel upon request.
19. Packages, briefcases or other personal effects are subject to search by authorized Patent and Trademark Office personnel upon request.
20. All verbal requests for compliance with these regulations or other posted Patent and Trademark Office Notices pertaining to activity in the Public Search Room for Patents, when made by authorized Patent and Trademark Office personnel, must be promptly complied with.

Persons violating these regulations may be denied the use of the facilities in the Public Search Room for Patents, and may further be subjected to prosecution under the Criminal Code. Additionally, the name of any person violating these regulations who is registered to practice before the Patent and Trademark Office may be forwarded to the Solicitor for appropriate action under 37 CFR 1.348.

C. MARSHALL DANN,
July 9, 1976. *Commissioner of Patents and Trademarks.*

[949 O.G. 2]

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(19) USE OF PATENT EXAMINING GROUP FACILITIES

This notice is supplemental to the Notice of July 9, 1976, entitled "Public Search Room for Patents" that was published in the OFFICIAL GAZETTE on August 3, 1976 (949 O.G 2).

The primary function of the Patent and Trademark Office is the examination of applications for patents and the issuance of valid patents based upon a search and consideration of the best available prior art. This can be accomplished only through maintaining strict search file integrity within the Patent Examining Group Facilities.

Therefore, under the provision of Rule 2 of the "Regulations for the Public Use of Records in the Public Search Room for Patents of the Patent and Trademark Office," 949 O.G. 2, the regulations appearing below are established for those authorized members of the Public using the facilities of the Patent Examining Groups. The regulations become effective April 4, 1977.

Although these supplemental regulations may cause some inconvenience, it is believed that with the cooperation and understanding of the public, a more efficient and reliable examination system within the Patent Examining Groups Will result.

A copy of the following "Regulations for Users of the Patent Examining Group Facilities," will be posted in each of the Patent Examining Groups and the Public Search Room for Patents:

Regulations for Users of the Patent Examining Group Search Facilities

1. Group facilities are defined as those areas in Buildings, 3, 34 and 4 of Crystal Plaza designated Examining Groups.
2. The use of the Group facilities for search purposes by members of the public is strictly limited to the search of materials not available in the Public Search Room for Patents or the Scientific Library and when it does not conflict with the regular business of Patent and Trademark personnel and only between the hours of 8:45 a.m. and 4:45 p.m. on regular business days.
3. Authorized Officials, under these Regulations, include Supervisory Patent Examiners and Examining Group Directors.
4. Under applicable statutes and regulations, including 40 U.S.C. 486(c): 41 CFR Subpart 101–20.3; and appropriate Sections of Department Organization Orders 30–3A and 30–3B of the Department of Commerce, the Regulations appearing below are established for those members of the public using the Group Facilities.
   A. All persons using these facilities are subject to the Regulations Governing Conduct on Federal Property, as specified in 41 CFR Subpart 101–20.3.
   B. All posted Official Notices are to be complied with.
   C. A valid User Pass must be prominently displayed when searching in the Group Facilities. User Passes are nontransferable and must be surrendered upon request to authorized officials.
   D. All persons holding User Passes must register with the Group Receptionist, unless otherwise directed, in each Examining Group where they search and must sign a log (e.g., indicating time-in, time-out, name, User Pass number, class(es) and subclass(es) searched).
   E. No patents, records or other documents of the Patent and Trademark Office shall be removed from the Group Facilities except by express written authorization by an authorized official in the Examining Group where the material resides. Such authorization will not be given for U.S. patents and other material readily available through the Scientific Library.
   F. Smoking is not permitted except in designated areas.
   G. No food or beverage in any form are to be consumed except in designated areas.
   H. Loud talking, use of radios, and any other form of activity which may disturb other members of the public or Patent and Trademark Office personnel are forbidden.
   I. Children brought into the Group Facilities must not be allowed to disturb others.
   J. The presence or use of equipment such as dictation equipment, reproducing machines, typewriters and photographic equipment is prohibited without prior permission from an authorized official in the Examining Group where the use is intended and then is permitted where its use does not conflict with Regulation H.
   K. Patents and other documents must not be removed from their shoes for any reason other than for cursory study thereof while kept in close proximate association with the shoe and must not be moved out of their normal sequence.
   L. All patent shoes must be promptly replaced in their proper location in the shoe case.
   M. All textbooks, journals and the like must be returned to their proper location.

N. The reserving of seats and/or working areas is prohibited.

O. All packages, briefcases or other personal effects brought into the Group Facilities are subject to search by authorized officials upon request and must be removed when leaving the Group Facilities.

P. All verbal requests for compliance with these regulations or other posted Patent and Trademark Office Notices pertaining to activity in the Group Facilities, when made by authorized officials, must be promptly complied with.

5. Persons violating these regulations may be denied the use of the facilities in the Examining Groups and Public Search Room for Patents, and may further be subject to prosecution under the Criminal Code. Additionally, the name of any person violating these regulations who is registered to practice before the Patent and Trademark Office may be forwarded to the Solicitor for appropriate action under 37 CFR 1.348.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

[956 O.G. 1118 (3-22-77)]

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(20) Regulations Relating to the Use of Patent and Trademark Office Records Facilities

Establishment of Enforcement Procedures

AGENCY: Patent and Trademark Office, Commerce.

ACTION: Notice.

SUMMARY: The Patent and Trademark Office is adopting procedures for enforcing existing regulations governing the use of the Public Search Room for Patents and the Patent Examining Group Search Facilities by members of the public. Enforcement of the existing regulations is necessary, and is intended by these procedures, to carry out the commitment of the Office to the public to promote an atmosphere conducive to research and maintain the integrity of the files in the Public Search Room for Patents and in the Examining Group Search Facilities.

EFFECTIVE DATE: 6-30-78.

FOR FURTHER INFORMATION CONTACT: Bradford R. Hunter, Deputy Assistant Commissioner for Administration, Patent and Trademark Office, Washington, D.C. 20231, (703) 557-2290.

SUPPLEMENTARY INFORMATION: The procedures will apply in enforcing the regulations for the public use of records of the Public Search Room for Patents and the Patent Examining Group Search Facilities. The regulations of the Public Search Room for Patents were published in the Federal Register for July 14, 1976, 41 F.R. 29009, and incorporated in a Search Room User Agreement entered into by each person who is issued a User Pass. Regulations for Users of the Patent Examining Group Search Facilities were established under Rule 2 of the regulations of the Public Search Room for Patents and were published in the OFFICIAL GAZETTE of March 22, 1977, 956 O.G. 1118. The procedures appear below.

PROCEDURES FOR ENFORCEMENT OF THE REGULATIONS FOR THE PUBLIC USE OF RECORDS IN THE PUBLIC SEARCH ROOM FOR PATENTS AND THE PATENT EXAMINING GROUP SEARCH FACILITIES

Under applicable statutes and regulations, including 40 U.S.C. 486(c); 41 CFR 101-20.3; and appropriate sections of Department Organization Orders 30-3A and 30-3B of the Department of Commerce, the procedures appearing below are established.

VIOLATION INVOLVING THE SECURITY SYSTEM

1. *Unauthorized removal of government property.*

(a) The Public Search Room for Patents is equipped with a security system designed to sound an alarm when an attempt to remove government property from the Public Search Room is detected. Each alarm signal triggered by a person passing through an exit to the Public Search Room will be investigated by security guards stationed at the Public Search Room exits. The person involved will be required to stop and allow the security guards to determine the cause of the alarm. If non-government property is the cause for the alarm, the person will be allowed to proceed without further delay. If unauthorized possession of government property is found to be the cause of the alarm, the person in whose possession the property is found will be advised that a violation has occurred and will be required to surrender the property to the Manager of the Public Search Room. An oral explanation for the possession of such property will be requested by the Manager.

(b) The Manager of the Public Search Room will immediately report each incident involving unauthorized possession of government property to the Deputy Assistant Commissioner for Administration by telephone, and if requested submit a written report, together with the government property and User Pass involved to the Deputy Assistant Commissioner for Administration.

(3) If it shall appear to the Deputy Assistant Commissioner for Administration that unauthorized possession of government property, detected by the security system, was inadvertent or otherwise unintentional, no further action will be taken. Otherwise, the Deputy Assistant Commissioner for Administration will request the person involved to show cause in writing why his or her User Pass should not be suspended or revoked pursuant to the terms of the Search Room User Agreement. A written decision will be rendered by the Deputy Assistant Commissioner for Administration after consideration of any timely submitted response.

OTHER VIOLATIONS OF THE PUBLIC SEARCH ROOM REGULATIONS

2. *All other violations of the Public Search Room Regulations.*

(a) Each observed or reported violation will be investigated by the Manager of the Public Search Room. If a violation has occurred and is not denied, the person involved will be verbally requested by the Manager to comply with the regulations. If the person involved denies that a violation has occurred, or refuses to comply with a verbal request of the Manager to comply with the regulations, or violates the regulations after having agreed to comply with them, the person will be required to surrender his or her User Pass to the Manager of the Public Search Room.

(b) The Manager of the Public Search Room will submit a written report of each violation, and the User Pass, if surrendered, to the Deputy Assistant Commissioner for Administration.

(c) If the Deputy Assistant Commissioner for Administration is satisfied that a reported violation was inadvertent or otherwise unintentional, the User Pass, if surrendered, will be returned and no further action will be taken. In all other cases, the Deputy Assistant Commissioner for Administration will request the person involved to show cause in writing why his or her User Pass should not be suspended or revoked pursuant to the terms of the Search Room User Agreement. A written decision will be rendered by the Deputy Assistant Commissioner for Administration after consideration of any timely submitted response.

VIOLATIONS OF THE PATENT EXAMINING GROUP SEARCH FACILITIES REGULATIONS

3. *Violations of the Regulations for Users of the Patent Examining Group Search Facilities.*

(a) Each observed or reported violation will be investigated by Authorized Official. If a violation has occurred, and is not denied, the person involved will be verbally requested to comply with the regulations. If the person involved denies that a violation has occurred, or refuses to comply with a verbal request to comply with regulations, or violates the regulations after having agreed to comply with them, the person involved will be required to surrender his or her User Pass to the Authorized Official.

(b) The Authorized Official will submit a written report of each violation, and the User Pass, if surrendered, to the Deputy Assistant Commissioner for Patents.

(c) If the Deputy Assistant Commissioner for Patents is satisfied that violation was inadvertent or otherwise unintentional, the User Pass, if surrendered, will be returned and no further action will be taken. In all other cases, the Deputy Assistant Commissioner for Patents will request the person involved to show cause in writing why his or her User Pass should not be suspended or revoked. A written decision will be rendered by the Deputy Assistant Commissioner for Patents after consideration of any timely submitted response.

PENALTIES

4. *Factors to be Considered in Assessing Penalties.*

(a) Penalties will be determined on a case-by-case basis. A record of penalties imposed for given violations will be kept and made available to the public upon request.

(b) Due weight may be given to prior violations of the regulations in assessing whether any given violation is willful, deliberate or intentional.

(c) Prior violations of the regulations will be considered in determining any specific penalty to be imposed. Depending upon the circumstances, the penalty for a first offense may range from an oral or written warning to a 60-day suspension of the User Pass. For a second offense, the penalty may be a suspension of from 5 days to 1 year. For a third offense, the penalty may range from a 30-day suspension to revocation of the User Pass.

GENERAL PROVISIONS

5. *Use of Search Facilities During Suspension or After Revocation of User Pass.*

No individual will be permitted to use the Public Search Room for Patents or the Patent Examining Group Search Facilities while his or her User Pass is suspended or revoked.

6. *Temporary User Pass.*

Any person whose User Pass was surrendered, but not suspended or revoked, may be issued a temporary User Pass which shall be valid until the User Pass is returned or a decision is rendered pursuant to paragraph 1(c), 2(c), 3(c).

7. *Absence of the Deputy Assistant Commissioner for Administration.*

In the absence of the Deputy Assistant Commissioner for Administration, the Director of the Office of Patent and Trademark Services will carry out the functions and responsibilities assigned to the Deputy Assistant Commissioner for Administration in paragraph 1(b) and (c) and 2(b) and (c).

8. *Absence of the Manager of the Public Search Room.*

In the absence of the Manager of the Public Search Room, the Acting Manager will carry out the duties and responsibilities assigned to the Manager in paragraphs 1(a), 1(b), 2(a) and 2(b).

9. *Assistance.*

The Manager of the Public Search Room and the Authorized Official may, when necessary request the Security Officer of the Patent and Trademark Office or the GSA to provide assistance in carrying out their functions in paragraphs 1(a), 2(a), and 3(a).

10. *Petitions.*

A decision rendered by the Deputy Assistant Commissioner for Administration, the Director of the Office of Patent and Trademark Services, or the Deputy Assistant Commissioner for Patents may be reviewed on petition to the Commissioner.

LUTRELLE F. PARKER,
May 5, 1978. *Acting Commissioner of Patents and Trademarks.*

[970 OG 114]

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(21) USE OF CERTIFICATION OF CORRECTION FORMS

The purpose of this notice is, to once again, remind patentees and their attorneys and agents to submit the text of any correction under 37 CFR 1.322 and 1.323 on the Certificate of Correction form, PTO–1050, which is available free of charge from the Patent and Trademark Office. The presentation of all corrections on this form permits its use as camera copy for prompt, direct offset printing of the Certificate of Correction.

Instructions for use of form PTO–1050 are printed on the top portion thereof, and are also set forth, in further detail, in Section 1402.02 of the Manual of Patent Examining Procedures. It is especially important that the typing be clean and clear. Both thin, light type and heavy, smudged type should be avoided. Changes and corrections are preferably made by use of white opaque correction fluid.

The typing should be within the borders printed on the form and a two-inch blank space should be left at the bottom of the last page of the form for the placement of the signature of the Attesting Officer.

Both sheets of the printed form should be forwarded to the Office. The copies should be stapled together only at the upper left-hand margin at the indicated location.

Copies of form PTO–1050 may be obtained, as needed, from either the Correspondence and Mail Division in Building 2, or from the receptionist in the lobby of Building 3, Crystal Plaza, Arlington, Va.

RICHARD J. SHAKMAN,
May 10, 1977. *Assistant Commissioner for Administration.*

[959 O.G. 3]

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(22) GOVERNMENT PUBLICATION SUBSCRIPTION SERVICE

The purpose of this notice is to inform subscribers of Federal Government publications serviced by the Government Printing Office, Superintendent of Documents, of the requirement to standardize subscriber change of address procedures.

It is imperative that the Government Printing Office be advised by each subscriber of an address change and that such advisement be accompanied by the latest subscription address label.

The Government Printing Office has the largest number of subscriptions of any activity in the United States, The Superintendent of Documents maintains about 835 mailing lists containing nearly 3 million addresses. Many of these subscribers frequently change their addresses and inform the Superintendent of Documents in a wide variety of methods. Some large organizations have as many as 20 identical subscriptions to the same street address but with different internal deliveries. Altogether the Government Printing Office is mailing nearly 5 million subscription copies each month. The Government Printing Office requests your cooperation to more effectively maintain the many mailing lists.

For your convenience, a change of address form is reproduced on the last page of the OFFICIAL GAZETTE.

BRADFORD R. HUTHER,
Acting Assistant Commissioner for Administration.

Aug. 9, 1977.

[962 O.G. 2]

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(23) NOTICE TO OFFICIAL GAZETTE SUBSCRIBERS

The Patent and Trademark Office announces a change in the point of contact for subscribers who have not been receiving all of their copies of the patent and/or trademark sections of the OFFICIAL GAZETTE, MPEP Revisions, Trademark Rules of Practice, Annual Indices, and all other patent and trademark publications.

The Superintendent of Documents advises that expiration notices are sent out approximately three months in advance of the expiration date. However, subscribers should not be dependent upon such notices. In the event that a notice is not received within two months of the expiration date, the subscriber should renew his subscription with the Superintendent of Documents and *attach a label* from the envelope in which he receives the gazette, together with a check covering the amount of the subscription.

All correspondence and inquiries concerning subscription services to patent and trademark related publications, and requests for reinstatement of subscriptions should be directed to:

Mr. C. A. LaBarre
Asst. Public Printer
Superintendent of Documents (SD)
Government Printing Office
Washington, D.C. 20401

This notice is effective with the publication date and supersedes the notice published on this subject in 939 O.G. 1, dated October 7, 1975.

Mar. 14, 1978. RICHARD J. SHAKMAN,
Assistant Commissioner for Administration.

[969 OG 2]

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(24) SUBSCRIPTION PRICING

The U.S. Government Printing Office advises that effective immediately, the subscription price of the OFFICIAL GAZETTE, Patents, has been changed as indicated below:

Subscription Price: $200.00 per annum domestic; $250.00 foreign
Single Copy Price: $4.00 domestic; $5.00 foreign

The above applies to non-priority mailings. This subscription will also be mailed at first-class rates of $300.00 domestic. Foreign first-class rates will be furnished upon request. All correspondence should be addressed to:

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

The subscription price of the OFFICIAL GAZETTE, Trademarks, has not been changed and remains at $88.40 per annum, domestic. Foreign mailing is $22.10 additional. Single copies are $1.70 each.

RICHARD J. SHAKMAN,
Assistant Commissioner for Administration.
May 9, 1978.

[970 OG 114]

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(25) MANUAL SUBSCRIPTIONS AND RULE AND STATUTE BOOKLETS

All subscriptions to various manuals and rules and the sale of various individual booklets which emanate from the Patent and Trademark Office, are handled by the Government Printing Office. Orders for new subscriptions or for the purchase of individual booklets should be addressed to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Inquiries concerning subscriptions previously placed or concerning revision material issued under a subscription should be addressed to the Superintendent of Documents, U.S. Government Printing Office, Customer Service Section SSOS, Washington, D.C. 20402.

However, as a service to patent and trademark practitioners and other interested parties, the following information is being published regarding revision schedules and rates for manual subscriptions, and rule and statute booklets. This information should be helpful in determining the currency of manuals and rules.

The Manual of Patent Examining Procedure (M.P.E.P.) is revised quarterly, the revisions being numbered consecutively and dated January, April, July and October of each year. The current subscription price for the M.P.E.P. is $19.65 (plus $4.95 for foreign mailing).

Revisions of the Manual of Classification for patents are presently published irregularly. However, beginning in 1978 it will be revised on a regular basis. These revisions will be published quarterly, dated January, April, July and October. The current subscription price for this manual is $44.00 (plus $11.00 for foreign mailing).

The Trademark Manual of Examining Procedure is normally revised anually, the revisions being numbered consecutively and dated January of each year. The current subscription price for the T.M.E.P. is $8.10 (plus $2.05 for foreign mailing).

The Trademark Rules of Practice (including the trademark statute) is revised from time to time whenever changes are made in the rules or the statute. The current Trademark Rules of Practice is the Ninth Edition, dated December 1976, and the current subscription price is $5.00 (plus $1.25 for foreign mailing).

The foregoing publications are available only by subscription. When revisions are issued, they are a part of the subscription and are mailed to subscribers automatically by the Superintendent of Documents of the Government Printing Office without additional charge. The original subscription price covers revisions until the Government Printing Office mails a notice of expiration of the subscription with a statement of the renewal fee necessary for continuing the subscription to the subscriber.

Both the patent rules and trademark rules are contained in an annual publication entitled 37 Code of Federal Regulations which is revised July 1 of each year. The price for the 1977 edition is $3.00 per copy.

The Patent Laws booklet is revised on an as-needed basis. The current edition is dated August 1976 and the current price is $2.10.

Due to the requirements of the printing process, these publications and revisions are generally not available until several months after the date which is printed on the revision or the booklet.

Date Oct. 12, 1977. LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

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(26) LOOSELEAF RULES OF PRACTICE IN PATENT AND TRADEMARK CASES

The Patent and Trademark Office has received a large number of inquiries about and suggestions for the publication of the Rules of Practice in Patent and Trademark Cases in looseleaf form again. The Office has been informed that such a publication of the patent and trademark Rules is available in a sturdy binder from:

Rules Service Company
Suite 301
3930 Knowles Avenue
Kensington, Maryland 20795
(301) 949-1090

The Rules Service Company indicates that each subscription includes a text of the rules that is up-to-date when sent, and all changes to that text that occur for the next twelve months, after which the subscription may be renewed. The cost of an initial subscription is $25.00, which should accompany the order.

The Government Printing Office continues to publish the Rules of Practice as Title 37, Code of Federal Regulations, which is reprinted annually.

Oct. 13, 1978. RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

[976 OG 2]

RECORDS AND FILES

(27) ACCESSIBILITY OF ASSIGNMENT RECORDS

In view of a number of inquiries as to the manner in which Rule 1.12 of the Patent Office Rules of Practice, as amended August 23, 1965 (819 O.G. 443) is to be applied, the procedure which it is planned to follow in certain types of cases is set forth below.

1. Assignments relating to applications for registration of trademarks will be open to public inspection as heretofore.

2. The Office will not open certain parts only of an assignment document to public inspection. If such a document contains two or more items, any one of which, if alone, would be open to such inspection, then the entire document will be open. Thus, if an assignment covers either a trademark or a patent in addition to one or more patent applications, it will be available to the public ab initio; and if it covers a number of patent applications, it will be so available as soon as any one of them is patented. Assignments relating only to one or more pending applications for patent will not be open to public inspection.

3. If the application on which a patent was granted is a division or continuation of an earlier case, the assignment records of that case will be open to public inspection; similar situations involving continuation in part applications will be considered on their individual merits.

4. Assignment records relating to reissue applications will be open to public inspection.

EDWARD J. BRENNER,
Dec. 15, 1965. *Commissioner.*

[822 O.G. 769]

(28) NOTIFICATION RE: CONFLICT IN ASSIGNMENT IN CERTAIN APPLICATIONS

Effective September 12, 1966, Assignment Branch will discontinue mailing notification in cases where there is a conflict in assignment between an original application and its divisional, continuation, substitute, or continuation-in-part application.

Assignments from original applications are applied without charge ONLY to divisional, continuation, or substitute applications where the date of the assignment is prior to the filing date of the later-filed application. (Continuation-in-part applications require separate assignments if they are to be issued to the assignee.)

Practitioners are reminded of the provisions of Rule 334. Unless an assignment is filed at or prior to the date of payment of the issue fee, the patent will normally be issued in the name of the inventor.

Section 306 of the Manual of Patent Examining Procedures will be amended appropriately.

W. R. ARMSTRONG,
Director, Office of Patent Services.

Concurred:
(signed) R. A. WAHL,
Assistant Commissioner.

[830 O.G. 442 (Sept. 12, 1966)]

(29) RECORDING OF INSTRUMENTS

Effective April 1, 1967, the Patent Office will accept and record legible certified copies of original assignments or other instruments.

The certified copy, if not in the English language, will not be recorded unless accompanied by a translation signed by the translator.

Certification shall be to the fact that the instrument submitted is a true copy of the original and shall be made by a notary public or, if in a foreign country, by a consular officer of the United States or an officer authorized to administer oaths and authenticated by a consular officer of the United States.

RICHARD A. WAHL,
Mar. 3, 1967. *Assistant Commissioner.*

[836 O.G. 1111]

(30) REMINDER

Furnishing Assignment Data at Time of Payment of Base Issue Fee

Practitioners are once again reminded of Rule 334, revised November 1969, which requires that . . . "At the time of payment of the issue fee, a statement must be furnished indicating whether or not an assignment has been filed with the Patent Office. In the event an assignment has been filed, such statement must include the name of the assignee and indicate whether or not an acknowledgment of a recorded assignment has been received from the Patent Office."

The Issue Fee Transmittal Form POL 85b, revised December 1969 and May 1973, provides space (Item 2) for Assignment Data which should be completed to comply with the Rule. Unless an assignee's name and address are identified in Item 2 of the Issue Fee Transmittal Form POL 85b, the patent will issue to the applicant. *Assignment Data printed on the patent will be based solely on information so supplied.*

A request for correction of error arising from incomplete or erroneous information furnished in Item 2 of POL 85b will not be granted as a matter of course and will be subject to adherence to all the requirements of Rule 323.

The recording of instruments in the Assignment Division is not affected by this Notice.

WILLIAM I. MERKIN,
Dec. 19, 1974. *Assistant Commissioner for Administration.*

[930 O.G. 984]

(31) ASSIGNEE NAMES

Effective April 1, 1976, only the first appearing name of an assignee will be printed on the patent where multiple names for the *same* party are identified on the Base Issue Fee Transmittal form, POL–85b. Such multiple names may occur when both a legal name and an "also known as" or "doing business as" name is also included. This printing practice will not, however, affect the existing practice of recording assignments with the Office in the Assignment Division. The assignee entry on form POL–85b should still be completed to indicate the assignment data as recorded in the Office. For example, the assignment filed in the Office and therefore the POL-85b assignee entry might read "Smith Company doing business as (d.b.a.) Jones Company." The assignee entry on the printed patent will read "Smith Company."

For purposes of compiling and publishing the 1976 Annual Index of Patentees, this change will be retroactive to patents issuing on January 6, 1976.

Dec. 17, 1975. RICHARD J. SHAKMAN,
Assistant Commissioner for Administration.

[942 O.G. 186]

(32) SUBMISSION OF UNIFORM ASSIGNEE NAMES ON THE ISSUE FEE PAYMENT FORM PTOL–85b

The Patent and Trademark Office is experiencing problems when computer-sorting assignee names for the Patentee Index because of the non-uniform use of the names of certain companies and corporations on the issue fee payment form PTOL–85b. The use of different spellings or nomenclature for the same company requires the Office to expend time and effort to determine whether the various name forms are in fact for the same company. If such inconsistencies are not corrected, patents to the same company will appear in different locations in the Patentee Index. An example of inconsistent use is "ABC Company, Ltd." and "ABC Co., Limited."

Therefore, persons who list assignee names on issue fee payment form PTOL–85b should ensure that the same company name form is used for all patents issuing to a particular company.

RICHARD J. SHAKMAN,
Nov. 17, 1977. *Assistant Commissioner for Administration.*

[965 O.G. 8]

(33) TITLE OF INVENTION CARRIED ON OFFICE RECORDS

The Patent and Trademark Office is experiencing an increased incidence in the number of newly filed applications in which the title of the invention is inconsistent within the papers. This has resulted in applicants requesting correction of the official filing receipt in many instances to indicate the title preferred by applicants.

Hereafter, whenever the title of the invention appears inconsistent within the papers of a newly filed application for patent, the records of the Office will carry the title as indicated on the first page of the specification and no corrected filing receipt will be issued to indicate another title. Note that 37 CFR 1.72(a) indicates that the title of the invention should appear as a heading on the first page of the specification.

It should also be noted that applicant may amend the title under 37 CFR 1.115 if any changes are subsequently desired before issuance of a patent.

BRADFORD R. HUTHER,
Acting Assistant Commissioner for Administration.
Aug. 31, 1977.

[962 O.G. 23]

(34) CERTIFIED COPIES OF APPLICATION AS ORIGINALLY FILED

The Patent Office has discontinued placing the assignments of record on the file wrapper of patent applications, except when a title report is requested or upon allowance of the case. Accordingly, the copies of applications prepared in response to requests for a certified copy of a patent application as filed, will no longer include an indication of assignments. Applicants desiring an indication of assignments of record should request separately certified copies of assignment documents.

ROBERT J. RISH,
Acting Assistant Commissioner for Administration.

[887 O.G. 1042 (6-22-71)]

FEES AND PAYMENT OF MONEY

(35) FEES IN CONNECTION WITH AMENDMENTS TO PATENT APPLICATIONS

This notice supplements the Notice of September 10, 1965, 818 O.G. 1207, September 28, 1965, relating to the administration of the act of July 24, 1965, Public Law 89-83, increasing certain fees payable to the United States Patent Office.

That act provides for the payment of additional fees on presentation of certain claims during the prosecution of applications. This provision applies in the case of applications filed on or after October 25, 1965, the effective date of the act. In such cases, when any amendment is filed which presents additional claims over the total number covered by fees previously paid, it should be accompanied by any additional fees due.

As in the case of claims presented after an application is filed and before first action, described in the Notice of September 10, 1965, when independent claims are subsequently presented so that the number of uncanceled independent claims in the application as amended exceeds the number of such claims paid for, an additional fee of $10 is due for each such additional claim. Similarly, an additional fee of $2 is due for each claim added in excess of the number of uncanceled claims, independent or dependent, already paid for.

Treatment of Amendments Unaccompanied by Fees Due

Amendments filed during and after the prosecution of an application and not accompanied by the entire fee due upon such filing will be treated as follows:

If such an amendment is filed in reply to an Office action it will be regarded as not being fully responsive thereto and the practice set forth in section 714.03 of the Manual of Patent Examining Procedure will be followed, care being taken to avoid any abuse of this practice by attorneys as, for example, by habitual submission of such amendments without fees or with insufficient fees.

If an amendment which is not filed in response to an Office action is of such a nature as to require a fee and is not accompanied by the full fee required, it will not be entered and the applicant will be so advised.

Amendment During Interference

An amendment filed in connection with a motion to add counts to an interference (Rule 233) must be accompanied by the claim or claims to be added and with the appropriate fees, if any, which would be due if the amendments were to be entered. It may be that the amendments will never be entered. Only upon the granting of the motion is it necessary for the other party or parties to present the claims, but the fees must be paid whenever presented.

Claims which have been submitted in response to a suggestion by the Office for inclusion in an application must be accompanied by the fee due, if any.

Amendment After Requirement for Restriction

After a requirement for restriction or election of species, nonelected claims will be included in determining the fees due in connection with a subsequent amendment unless such claims are canceled.

Refunds

Money paid in excess or by mistake in connection with an amendment will be refunded in the usual manner.

Amendments affecting the claims cannot serve as the basis for granting any refund.

Money paid in connection with the filing of a proposed amendment will not be refunded by reason of the nonentry of the amendment.

EDWARD J. BRENNER,
Jan. 13, 1966. *Commissioner of Patents.*

[823 O.G. 814]

(36) DEPOSIT ACCOUNTS—STATUTORY FEE CHARGES

Beginning on May 1, 1966, and until further notice, statutory fees, including filing fees for patent, design, and trademark applications, issue fees, appeal fees and opposition, cancellation and petition fees may be charged against the deposit accounts provided for by Rule 25(a) of the Rules of Practice in patent cases. During this period the prohibition of Rule 25(b) against such charges will be suspended.

In view of the facts that these fees are indispensable parts of the actions to which they relate and that the charging of a fee against an account which does not contain sufficient funds to cover it cannot be regarded as a payment of the fee, it is evident that the overdrawing of a deposit account may result in the loss of a vital date and may also impose a substantial burden on the Patent Office in making appropriate correction of its records. It is, therefore, necessary that effective steps be taken to avoid such overdrafts, as follows:

Checks of all accounts will be made periodically, and if any account is found to have been overdrawn, it will be immediately removed from the active accounts and no further drafts on it will be honored. Prompt payment of the outstanding balance will be required and the depositor or his attorney may be called on for an itemized statement identifying all statutory fees charged against the account during the period in question in order that it may be ascertained whether any previously granted date should be withdrawn.

It is emphasized that the success of the procedure outlined above depends upon the maintenance of a sufficient balance in deposit accounts at all times to meet any charges made against them. The Office must, therefore, strictly refuse to permit any depositor who has once overdrawn his account to maintain such an account in the future and in the event that any substantial number of overdrafts occurs it may be necessary to reestablish the prohibition of Rule 25(b) against charging statutory fees against deposit accounts.

Accordingly, effective May 1, 1966, the requirement of Rule 25(a) that an amount sufficient to cover all charges made against an account must always be on deposit will be strictly enforced, regardless of whether any fee is included in such charges and where this requirement is not complied with the account involved will be removed from the active accounts.

EDWARD J. BRENNER,
Feb. 23, 1966. *Commissioner.*

[824 O.G. 1200]

(37) PRACTICE IN THE USE OF ACCOUNTS FOR PAYMENT OF STATUTORY FEES

In the OFFICIAL GAZETTES of March 15, 22, and 29, there appeared copies of an announcement by the Commissioner providing for a trial use of accounts established under Rule 25 for the payment of statutory fees. A number of questions have come up in connection with the use of accounts in the payment of these fees prescribed by Public Law 89-83 and, in the interest of uniform practice, publication of a statement is warranted.

A general direction by an applicant or attorney to charge to an account these fees as they arise in any application prosecuted by the applicant, the attorney, or the firm will not be effective for such a purpose. Authority to make charges will be limited to a particular application.

A separate direction to charge shall be filed for each fee. Each such direction to charge a fee shall be transmitted on a separate sheet of paper and, in the case of fees based on

modification of claims shall include the best estimate of the fee due. Failure to include such an estimate provides the basis for a refusal to enter any amendment transmitted therewith, as an incomplete response. Where variable fees are involved inclusion of a direction to charge or credit a deficiency or overpayment would appear appropriate.

An issue fee will not be charged to an account until a notice of allowance has been forwarded and a reply to that notice received.

For the purposes of determining the fee due the Patent Office, a claim will be treated as dependent if it contains reference to one other claim in the application. A claim determined to be dependent by this test will be entered if the fee paid reflects this determination. This does not, however, prevent the rejection of such a claim as improper, if, in fact, it is not a dependent claim.

EDWARD J. BRENNER,
Apr. 12, 1966. *Commissioner of Patents.*

[825 O.G. 1183]

(38) DEPENDENT CLAIMS

Although the notice published on October 5, 1965, in 819 O.G. 3, explained that for the purposes of the present fee bill, Public Law 89-83, approved July 24, 1965, the Patent Office will consider a proper dependent claim as being one which incorporates by reference a single preceding claim, whether independent or dependent, and includes all the limitations of the claim so incorporated, there appears to be still some uncertainty on this matter and it is therefore thought to be desirable to elaborate it.

Since the initial determination, for fee purposes, as to whether a claim is dependent must be made by persons other than examiners, it is necessary, at that time, to accept as dependent virtually every claim which refers to another claim, without determining whether there is actually a true dependent relationship. Such acceptance does not, however, preclude a subsequent holding by the examiner that a claim is not a proper dependent claim.

An essential characteristic of a proper dependent claim is that it shall include every limitation of the claim from which it depends (35 U.S.C. 112) or in other words that it shall not conceivably be infringed by anything which would not also infringe the basic claim. Thus, for example, if claim 1 recites the combination of elements *a*, *b*, *c* and *d*, a claim reciting the structure of claim 1 in which *d* was omitted or replaced by *e* would not be a proper dependent claim, even though it placed further limitations on the remaining elements or added still other elements.

The fact that a dependent claim which is otherwise proper might require a separate search or be separately classified from the claim on which it depends would not render it an improper dependent claim, although it might result in a requirement for restriction.

The fact that the independent and dependent claims are in different statutory classes does not, in itself, render the latter improper. Thus, if claim 1 recites a specific product a claim for the method of making the product of claim 1 in a particular manner would be a proper dependent claim since it could not be infringed without infringing claim 1. Similarly, if claim 1 recites a method of making a product, a claim for a product made by the method of claim 1 could be a proper dependent claim. On the other hand, if claim 1 recites a method of making a specified product, a claim to the product set forth in claim 1 would not be a proper dependent claim if the product might be made in other ways.

Any claim which is in dependent form but which is so worded that it does not, in fact, include every limitation of the claim on which it depends, will be required to be cancelled as not being a proper dependent claim; and cancellation of any further claim depending on such a dependent claim will be similarly required. The applicant may thereupon amend the claims to place them in proper dependent form, or may redraft them as independent claims upon payment of any necessary additional fee.

The basis for the difference in fees between independent and dependent claims is the fact that the examination of a dependent claim is normally a comparatively simple matter after the claim on which it depends has been examined. This relationship, however, obtains only when the independent claim represents a bona fide attempt to define the invention and to distinguish it from the known prior art. Accordingly, the presentation of a claim which on its face is obviously unpatentable or indefinite, as basis on which other claims are dependent, is not considered to be proper practice. One example of such a practice involves the use of a claim drawn to "all the features of novelty herein disclosed," with other claims, which actually recite the features thought to be novel, being dependent on the first. A similarly objectionable arrangement would involve the use, as a basic independent claim, of a claim merely reciting "a wheeled vehicle," "an amino acid" or "an internal combustion engine."

Such a practice as that just described involves not only an attempt to evade the fee provisions of Public Law 89-83, but also the presentation of a claim known by the attorney or agent presenting it to be unpatentable. Any registered patent attorney or agent who makes a practice of presenting claims of this character may be called on to explain his actions.

(signed) EDWARD J. BRENNER,
June 8, 1966. *Commissioner.*

[828 O.G. 1]

(39) DEPOSIT ACCOUNTS

The practice instituted on May 1, 1966, pursuant to the notice of February 23, 1966 (824 O.G. 1200), whereby statutory fees may be charged against deposit accounts, and such accounts are closed if overdrawn, has resulted in certain difficulties for the Patent Office and deposit account holders. It has been decided therefore to modify that practice as indicated below.

As was pointed out in that notice, the charging of a fee against an overdrawn account cannot be considered as payment of the fee until a proper balance is restored or payment is made in some other way. Accordingly, deposit account holders who charge such fees must assume the risk of losing vital dates if they do not maintain a proper balance in their accounts at all times.

Apart from this, however, the overdrawing of an account places a burden on the Patent Office, particularly where a number of items are charged after the overdraft occurs, and it is appropriate that those who are responsible for causing such a condition should bear the cost of correcting it. In view of this fact, and of the hardship frequently caused if an account is permanently closed, the practice of closing deposit accounts merely because they are overdrawn will be discontinued, effective August 1, 1966. In lieu thereof an overdrawn account will be immediately suspended and no charges will be accepted against it until a proper balance is restored, together with a payment of ten dollars to cover the work done by the Patent Office incident to suspending and reinstating the account and dealing with charges which may have been made in the meantime. It is expected, however, that reasonable precautions will be taken in all cases to avoid overdrafts, and if an account is suspended repeatedly it will be necessary to close it.

Similarly, because of the burden placed on the Patent Office incident to the operation of deposit accounts, a charge of ten dollars will be made for opening each new account.

EDWARD J. BRENNER,
June 23, 1966. *Commissioner.*

[828 O.G. 377]

(40) PAYMENT OF ADDITIONAL FEES FOR CLAIMS

Section 41(a) 1 of Title 35 U.S. Code, provides that the Commissioner shall charge "On filing each application for an original patent, except in design cases, $65, in addition on filing or on presentation at any other time, $10 for each claim in independent form which is in excess of one, and $2, for each claim (whether independent or dependent) which is in excess of ten. . . . Errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner."

The Office accords filing dates to applications with insufficient fees provided the basic $65.00 filing fee is present. In such cases a notice is mailed requiring that the balance of the fee be paid within two months from the notification of the deficiency.

Occasionally applications contain informal claims that counsel feels should not be present. However, since alteration after

execution and before filing is prohibited and could result in the application being stricken from the files, such applications must be filed in the form in which they are received from applicants. In the past the Office has charged fees for these informal claims, resulting in an unnecessary financial burden on applicants. In the future, applicants will be permitted to file with the application a preliminary amendment limited to cancellation of such claims, which will diminish the number of claims to be considered in calculating the filing fee to be paid. Any other changes should be the subject of a separate amendment.

On the other hand, if a preliminary amendment cancelling such claims does not accompany the application at the time the application is filed, the notification of the fee deficiency will inform applicant of his option of correcting the error by (1) paying the additional fee, or (2) filing an amendment cancelling claims, thereby reducing the number of claims to be considered in calculating the fee. However, it should be noted that once the fee for claims is paid, no refund will be made even though applicant later decides that certain claims are informal or otherwise unnecessary.

This change, which will become effective December 1, 1978, should benefit both applicants and the Office. It will alleviate applicants' financial burden and will also result in more efficient examination.

DONALD W. BANNER,
Nov. 9, 1978. *Commissioner of Patents and Trademarks.*

[977 OG 8]

APPLICATION CONTENT

(41) GUIDELINES FOR DRAFTING A MODEL PATENT APPLICATION UNDER THE REVISED RULES

The following guidelines illustrate the preferred layout and content for patent applications. They have been prepared to supplement the amendments to the rules which are effective January 1, 1967. These guidelines are suggested for the applicant's use.

Arrangement and Contents of the Specification

The following order of arrangement is preferable in framing the specification and, except for the title of the invention, each of the lettered items should be preceded by the headings indicated.

(a) Title of the Invention.
(b) Abstract of the Disclosure.
(c) Cross-References to Related Applications (if any).
(d) Background of the Invention.
  1. Field of the Invention.
  2. Description of the Prior Art.
(e) Summary of the Invention.
(f) Brief Description of the Drawing.
(g) Description of the Preferred Embodiment(s).
(h) Claim(s).

(a) *Title of the Invention:* (See Rule 72(a).) The title of the invention should be placed at the top of the first page of the specification. It should be brief but technically accurate and descriptive.

(b) *Abstract of the Disclosure:* (See Rule 72(b), MPEP 608.01(a), and 831 O.G. 1328, October 25, 1966.)

(c) *Cross-References to Related Applications:* (See Rule 78 and MPEP 201.11.)

(d) *Background of the Invention:* The specification should set forth the Background of the Invention in two parts:

(1) Field of the Invention: A statement of the field of art to which the invention pertains. This statement may include a paraphrasing of the applicable U.S. patent classification definitions. The statement should be directed to the subject matter of the claimed invention.

(2) Description of the Prior Art: A paragraph(s) describing to the extent practical the state of the prior art known to the applicant, including references to specific prior art where appropriate. Where applicable, the problems involved in the prior art, which are solved by the applicant's invention, should be indicated.

(e) *Summary:* A brief summary or general statement of the invention as set forth in Rule 73. The summary is separate and distinct from the abstract and is directed toward the invention rather than the disclosure as a whole. The summary may point out the advantages of the invention or how it solves problems previously existent in the prior art (and preferably indicated in the Background of the Invention). In chemical cases it should point out in general terms the utility of the invention. If possible, the nature and gist of the invention or the inventive concept should be set forth. Objects of the invention should be treated briefly and only to the extent that they contribute to an understanding of the invention.

(f) *Brief Description of the Drawing:* A reference to and brief description of the drawing(s) as set forth in Rule 74.

(g) *Description of the Preferred Embodiment(s):* A description of the preferred embodiment(s) of the invention as required in Rule 71. The description should be as short and specific as is necessary to adequately and accurately describe the invention.

Where elements or groups of elements, compounds, and processes, which are conventional and generally widely known in the field to which the invention pertains, form a part of the invention described and their exact nature or type is not necessary for an understanding and use of the invention by a person skilled in the art, they should not be described in detail. However, where particularly complicated subject matter is involved or where the elements, compounds, or processes may not be commonly or widely known in the field, the specification should refer to another patent or readily available publication which adequately describes the subject matter.

(h) *Claim(s):* (See Rule 75.) A claim may be typed with the various elements subdivided in paragraph form. There may be plural indentations to further segregate subcombinations or related steps.

Reference characters corresponding to elements recited in the detailed description and the drawings may be used in conjunction with the recitation of the same element or group of elements in the claims. The reference characters, however, should be enclosed within parentheses so as to avoid confusion with other numbers or characters which may appear in the claims. The use of reference characters is to be considered as having no effect on the scope of the claims.

Claims should preferably be arranged in order of scope so that the first claim presented is the broadest. Where separate species are claimed, the claims of like species should be grouped together where possible and physically separated by drawing a line between claims or groups of claims. (Both of these provisions may not be practical or possible where several species claims depend from the same generic claim.) Similarly, product and process claims should be separately grouped. Such arrangements are for the purpose of facilitating classification and examination.

The form of claim required in Rule 75(e) is particularly adapted for the description of improvement type inventions. It is to be considered a combination claim and should be drafted with this thought in mind.

In drafting claims in accordance with Rule 75(e), the preamble is to be considered to positively and clearly include all the elements or steps recited therein as a part of the claimed combination.

Oath

(See Rule 65.) Where one or more previously filed foreign applications are cited or mentioned in the oath, complete identifying data, including the application or serial number as well as the country and date of filing, should be provided.

EDWARD J. BRENNER,
Date: Oct. 12, 1966. *Commissioner of Patents.*

[832 O.G. 5]

(42) USE OF METRIC SYSTEM OF MEASUREMENTS IN PATENT APPLICATIONS

In order to minimize the necessity in the future for converting dimensions given in the English system of measurements to the metric system of measurements when using printed patents as research and prior art search documents, all patent applicants are strongly encouraged to use either (1) only metric (S.I.) units, or (2) English units together with their metric system equivalents, when describing their inventions in the specifications of patent applications. This practice, however, is not being made mandatory at this time.

The initials S.I. stand for "Systeme International d'Unites," the French name for the International System of Units, a modernized metric system adopted in 1960 by the International General Conference of Weights and Measures based on precise unit measurements made possible by modern technology.

This request is made as part of the long-range program for conversion to metric units currently being conducted by the Federal Government.

Publications dealing with the metric system are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 and the American National Standards Institute, 1430 Broadway, New York, N.Y. 10018.

C. MARSHALL DANN,
July 1, 1974. *Commissioner of Patents.*

[924 O.G. 1104]

(43) FILING OF NON-ENGLISH LANGUAGE APPLICATIONS

This notice is in response to inquiries regarding the filing of applications in a language other than English. The Office has received a few such applications in the past in emergency situations where the filing of a non-English language specification was the only possibility of saving a foreign priority date or preventing the running of a statutory bar. In such situations the Office practice has been to accord the application a filing date if it includes all of the component parts required by 35 U.S.C 111, and to require applicant to submit a verified translation of the previously filed application within two months.

In view of the inquiries received, it is considered appropriate that the Office clarify and publicize its practice in this area to avoid misunderstandings.

Accordingly, beginning February 1, 1976, the Office will accord a filing date to an application meeting the requirements of 35 U.S.C. 111 even though some or all of the application papers, including the written description and the claims, is in a language other than English and hence does not comply with 37 CFR 1.52, *provided:*

(1) the oath or declaration is signed and physically attached to the specification and claims to which it refers; and
(2) the application papers are accompanied by a statement, in English, from the applicant, his attorney or agent, certifying that is has been considered necessary to file the non-English language application in order to save a foreign priority date or prevent the running of a statutory bar.

A verified English translation of the non-English language papers should either accompany the application papers or be filed in the Office no later than two months after a notice requesting the translation has been mailed by the Office.

A subsequently filed verified English translation must contain the complete identifying data for the application in order to permit prompt association with the papers initially filed. Accordingly, it is strongly recommended that the original application papers be accompanied by a cover letter and a self-addressed return post card, each containing the following identifying data in English: (*a*) applicant's name(s); (*b*) title of invention; (*c*) number of pages of specifications, claims, and sheets of drawings; (*d*) whether oath or declaration was filed and (*e*) amount and manner of paying the filing fee.

The translation must be a literal translation verified as such by the translator, and must be accompanied by a signed request from the applicant, his attorney or agent, asking that the verified English translation be used as the copy for examination purposes in the Office. If the verified English translation does not conform to idiomatic English and United States practice it should be accompanied by a preliminary amendment making the necessary changes without the introduction of new matter prohibited by 35 U.S.C. 132. In the event the verified literal translation is not timely filed in the Office the application will be regarded as abandoned.

It should be recognized that this practice is intended for emergency situations to prevent loss of valuable rights and should not be routinely used for filing applications. There are at least two reasons why this should not be used on a routine basis. First, there are obvious dangers to applicant and the public if he fails to obtain a correct literal translation. Second, the filing of a large number of applications under the procedure will create significant administrative burdens on the Office.

The practice will be closely monitored to determine whether or not it should be continued.

C. MARSHALL DANN,
Dec. 31, 1975. *Commissioner of Patents and Trademarks.*

[942 O.G. 1552]

(44) FILING OF COPIES OF PATENT APPLICATIONS

Beginning on October 1, 1978, the Office will accord a filing date to facsimile or other reproduced copies of United States national patent applications meeting the requirement of 35 U.S.C. 111, *provided:*

(1) the application was properly executed by the inventor(s) prior to transmission of the copy.
(2) the copy filed is a complete copy and bears a reproduction of applicant's signature, and
(3) the originally signed application is filed no later than two months after the facsimile or other reproduced copy is filed.

Authority for this practice is found in 35 U.S.C. 26 as interpreted by the District Court decisions *Neergaard* v. *Dann*, Civil Action No. 76-536, December 20, 1976 (D.D.C.) and *Dietzel et al.* v. *Commissioner of Patents and Trademarks*, Civil Action No. 75-0298, December 22, 1976 (D.D.C.).

In order to ensure prompt association with the copy of the application initially filed it is strongly recommended that the subsequently filed original application be accompanied by a cover letter signed by the applicant or the attorney or agent averring it is the original of the earlier filed facsimile application, identifying the application by applicant's name, title of invention, date of initial filing and serial number, if known.

It should be recognized that this practice is intended for emergency situations to prevent loss of valuable rights and should not be used routinely for filing applications.

The above procedure does not apply to international applications filed under the Patent Cooperation Treaty since procedures to cover unsigned international applications are already provided for in PCT Article 14(1)(a)(i) and (b) and PCT Rule 26.2.

DONALD W. BANNER,
Aug. 28, 1978. *Commissioner of Patents and Trademarks.*

(45) GRAPHICAL ILLUSTRATIONS IN THE SPECIFICATION

For convenience many applicants have been including graphs or other types of graphical illustrations in the text portion of the specification. These illustrations do not come within the purview of 37 C.F.R. 1.58 which permits tables and chemical and mathematical formulas in the specification in lieu of formal drawings. Frequently, these graphical illustrations do not have satisfactory reproduction characteristics. Moreover, these reproductions are generally less than satisfactory due to the fact that the illustrations are usually reduced in size in order to fit a column of the printed patent page. Accordingly, effective immediately, graphs and graphical type illustrations in the specification will be objected to under 37 C.F.R. 1.58(a) and drawings pursuant to 37 C.F.R. 1.81 will be required.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.
Jan. 12, 1978.

[967 OG 2]

(46) TITLE 37—PATENTS, TRADEMARKS AND COPYRIGHTS

CHAPTER I—PATENT AND TRADEMARK OFFICE, DEPARTMENT OF COMMERCE

Rule Promulgation Relating to Multiple Dependent Claims and Drawing Requirements

AGENCY: Patent and Trademark Office, Commerce

ACTION: Final Rule.

SUMMARY: This notice adopts rule changes which permit the use of multiple dependent claims and prescribe when, and in what circumstances, drawings or additional drawings need to be furnished. These rule changes are necessary because of

amendments to sections 41, 112 and 113, Title 35 United States Code, which become effective on January 24, 1978. The rule changes are intended to carry into effect the changes made by the amendments to the noted sections.

DATES: Effective date, January 24, 1978. The amended rules apply to applications filed on and after the effective date, even though such applications may be entitled to the benefit of an earlier filing date.

FOR FURTHER INFORMATION CONTACT: Mr. Louis O. Maassel by telephone at (703) 557-3070, or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

SUPPLEMENTARY INFORMATION: This notice changes several rules to conform with 35 U.S.C. sections 41, 112 and 113 as amended by Public Law 94-131, effective January 24, 1978, the date of entry into force of the Patent Cooperation Treaty. Notice was given on January 12, 1977 in the Federal Register (42 FR 2632-2644) and on February 8, 1977 in the OFFICIAL GAZETTE (955 O.G. 350-363) of a proposal to amend Title 37 of the Code of Federal Regulations due to the entry into force of the Patent Cooperation Treaty and Public Law 94-131 (94th Congress; 89 Stat. 658). Interested persons were invited to comment on the proposal on or before May 26, 1977, on which date a public hearing was held. The time for submitting written comments was extended until August 31, 1977 by a notice published on June 23, 1977 in the Federal Register (42 FR 31812) and on July 12, 1977 in the OFFICIAL GAZETTE (960 O.G. 8). Comments relevant to the rule changes being promulgated were submitted by only two persons. These comments have been subtantially adopted. A transcript of the hearing, the letters and written statements received, and a summary and analysis of the comments are available for public inspection in Room 11E10 of Crystal Plaza Building 3, 2021 Jefferson Davis Highway, Arlington, Virginia. These changes provide for the filing of multiple dependent claims and for later submission of drawings in applications where such drawings are not necessary for the understanding of the subject matter sough to be patented. This rule change promulgation is directed to only those portions of the proposed rule changes relating to sections 1.75, 1.81 and 1.83 which are required on January 24, 1978, due to the coming into force of Public Law 94-131. The other proposed rules relating to implementation of the Patent Cooperation Treaty will be promulgated later.

Good cause is found for the publication of this notice less than 30 days before the effective date of these rules, since it would be in the public interest for the amended rules to take effect on the same date as the statute.

Paragraph (*c*) of Section 1.75 differs from the proposal in that two additional sentences have been added indicating how fees will be calculated for multiple dependent claims and claims depending therefrom. No comments were received concerning this rule as originally proposed.

Paragraph (*c*) of Section 1.81 has been rewritten to adopt a revision suggested by one of the two persons who submitted comments. Paragraph (*d*) is a quote from revised 35 U.S.C. 113 and is added to include the restrictions relating to additional drawings.

The proposed amendments to paragraphs (*a*) and (*b*) of Section 1.83 were opposed by both persons who commented and they have not been adopted, but a new paragraph (*c*) is added in view of those comments. Accordingly, 37 CFR Part 1 is amended as follows:

1. By amending Section 1.75 by revising paragraph (*c*) and adding paragraphs (*f*) and (*g*) to read as follows:

Section 1.75 *Claim(s).*

* * * * * * *

(*c*) One or more claims may be presented in dependent form, referring back to and further limiting another claim or claims in the same application. Any dependent claim which refers to more than one other claim ("multiple dependent claim") shall refer to such other claims in the alternative only. A multiple dependent claim shall not serve as a basis for any other multiple dependent claim. For fee calculation purposes, a multiple dependent claim will be considered to be that number of claims to which direct reference is made therein. For fee calculation purposes, also, any claim depending from a multiple dependent claim will be considered to be that number of claims to which direct reference is made in that multiple dependent claim. Claims in dependent form shall be construed to include all the limitations of the claim incorporated by reference into the dependent claim. A multiple dependent claim shall be construed to incorporate by reference all the limitations of each of the particular claims in relation to which it is being considered.

* * * * * * *

(*f*) If there are several claims, they shall be numbered consecutively in Arabic numerals.

(*g*) All dependent claims should be grouped together with the claim or claims to which they refer to the extent possible.

2. By revising Section 1.81 to read as follows:

Section 1.81 *Drawings required.*

(*a*) The applicant for a patent is required to furnish a drawing of his invention where necessary for the understanding of the subject matter sought to be patented; this drawing must be filed with the application.

(*b*) Drawings may include illustrations which facilitate an understanding of the invention (for example, flow sheets in cases of processes, and diagrammatic views).

(*c*) Whenever the nature of the subject matter sought to be patented admits of illustration by a drawing without its being necessary for the understanding of the subject matter and the applicant has not furnished such a drawing, the examiner will require its submission within a time period of not less than two months from the date of the sending of a notice thereof.

(*d*) Drawings submitted afer the filing date of the application may not be used to overcome any insufficiency of the specification due to lack of an enabling disclosure or otherwise inadequate disclosure therein, or to supplement the original disclosure thereof for the purpose of interpretation of the scope of any claim.

3. By adding a new paragraph (*c*) to Section 1.83 to read as follows:

Section 1.83 *Content of drawing.*

* * * * * * *

(*c*) Where the drawings do not comply with the requirements of paragraph (*a*) and (*b*) of this section, the examiner shall require such additional illustration within a time period of not less than two months from the date of the sending of a notice thereof. Such corrections are subject to the requirements of Section 1.81(*d*).

The Patent and Trademark Office has determined that this document does not contain a major proposal requiring preparation of an Economic Impact Statement under Executive Orders 11821 and 11949 and OMB Circular A-107.

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

Approved: Jan 12, 1978.

JORDAN J. BARUCH,
Assistant Secretary for Science and Technology.

[43 FR 4014]

Dated: Jan. 31, 1978.

[FR Doc. 78-2607; Filed 1-30-78; 8:45 am]

[967 OG 12]

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(47) MULTIPLE DEPENDENT CLAIMS AND NEW DRAWING FILING REQUIREMENTS

Introduction

On January 24, 1978, Public Law 94-131 (pages 108-115 of "Patent Laws," August 1976 issue) and the Patent Cooperation Treaty came into force. This public law amends the

patent statute, Title 35, United States Code, by providing for procedures and requirements set forth in the Patent Cooperation Treaty. Some of these statutory amendments also effect the laws governing the processing and examination of regular United States national applications filed on and after January 24, 1978.

The amendments of the patent law which will affect *U.S. patent applications filed on and after January 24, 1978*, relate to two elements of the patent application: the claims and the drawings. With regard to claims, the amendments to 35 U.S.C. 41 and 112 provide for multiple dependent claims in accordance with PCT Rule 6.4. With regard to drawings, the amendment to 35 U.S.C. 113 changes the requirements for filing drawings in order to obtain a filing date in accordance with PCT Article 7.

Purpose

This memorandum establishes in more detail the new procedures required by the amended statute. Any questions concerning these instructions may be directed to either Mary Turowski (extension 7–3776) in the administration area or Louis Maassel (extension 7–3070) in the examining area.

Revised 37 CFR sections 1.75(c), (f) and (g); and 1.81 and 1.83(c) were published in the OFFICIAL GAZETTE of February 21, 1978.

MULTIPLE DEPENDENT CLAIMS

Generally, a multiple dependent claim is a dependent claim which refers back in the alternative to more than one preceding independent or dependent claim.

The second paragraph of 35 U.S.C. section 112 has been revised in view of the multiple dependent claim practice introduced by the Patent Cooperation Treaty. Thus, section 112 authorizes multiple dependent claims, as long as they are in the alternative form (e.g., "A machine according to claims 3 *or* 4, further comprising . . ."). Cumulative claiming (e.g., "A machine according to claims 3 *and* 4, further comprising . . .") is *not* permitted. A multiple dependent claim may refer in the alternative to only one set of claims. A claim such as "A device as in claims 1, 2, 3 or 4, made by a process of claims 5, 6, 7 or 8" is improper. Section 112 allows reference to only a particular claim. Furthermore, a multiple dependent claim may *not* serve as a basis for any other multiple dependent claim, either directly or indirectly. These limitations help to avoid undue confusion in determining how many prior claims are actually referred to in a multiple dependent claim.

The amendment of the second paragraph of section 112 further clarifies that the limitations or elements of each claim incorporated by reference into a multiple dependent claim must be considered separately. Thus, a multiple dependent claim, as such, does not contain all the limitations of all the alternative claims to which it refers, but rather, contains in any one embodiment only those limitations of the particular claim referred to for the embodiment under consideration. Hence, a multiple dependent claim must be considered in the same manner as a plurality of single dependent claims.

Restriction Practice

For restriction purposes, each embodiment of a multiple dependent claim will be considered in the same manner as a single dependent claim. Therefore, restriction may be required between the embodiments of a multiple dependent claim. Also, some embodiments of a multiple dependent claim may be held withdrawn while other embodiments are considered on their merits.

Handling of Multiple Dependent Claims by the Application Division

The Application Division will be responsible for verifying whether multiple dependent claims filed with the application are in proper alternative form, that they depend only upon prior independent and single dependent claims and also for calculating the amount of the filing fee. A new form, PTO–1360, has been designed to be used in conjunction with the current fee calculation form PTO–875.

Handling of Multiple Dependent Claims by the Examining Group Clerical Staff

The examining group clerical staff is responsible for verifying compliance with the statute and rules of multiple dependent claims added by amendment and for calculating the amount of any additional fees required. This calculation should be performed on form PTO–1360.

If a multiple dependent claim (or claims) is added in an amendment without the proper fee, the amendment will not be entered until the fee has been received. In view of the requirements for multiple dependent claims, no amendment containing new claims or changing the dependency of claims will be entered before checking whether the paid fees cover the costs of the amended claims. The applicant, or his attorney or agent, will usually be contacted to pay the additional fee in the same manner as currently in existence for such defects. Where a letter is written in insufficient fee situations, a copy of the multiple dependent claim fee calculation form PTO–1360 will be included for applicant's information.

Handling of Dependent Claims by the Examiner

Should any multiple dependent claim be in an application filed prior to January 24, 1978 or include a claim association or claim structure that violates any of the prohibitions, the claim will be objected to as not being in proper form as required by 37 CFR 1.75 in the next Office action. Such an improper claim will not be further treated on the merits.

When referring to a singular dependent claim or a single embodiment of a multiple dependent claim, as when making a rejection, such a claim or embodiment will be referred to by using the number of all of the claims involved in that claim or embodiment, starting with the highest. For example, if claim 2 was dependent on claim 1, the notations would be 2/1. If in the same application, claim 3 was independent and claim 4 was multiple dependent on claims 2 or 3, the notations would be 4/2/1 and 4/3. Furthermore, if claim 5 depended from claim 4, the notations would be 5/4/2/1 and 5/4/3. Each of these embodiments will be treated individually. It would be possible for claim 4/2/1 to be rejected under section 102 and claim 4/3 to be indicated as avoiding the prior art and being allowable if rewritten in independent form. A number of embodiments may be grouped together if there is a common ground of rejection, but it must be clear how each embodiment is treated.

A claim, such as claim 4, will not be allowed until all embodiments covered thereby are allowable. If an embodiment of a multiple dependent claim avoids the art while other embodiments are rejected over prior art, a statement will be made that that embodiment avoids the art and would be allowed if rewritten in separate dependent or independent form. Wording similar to the following may be used:

> "Embodiment ———— would be allowable if rewritten as a proper dependent or independent claim which contains only the limitations of this embodiment."

Calculation of Fees When Multiple Dependent Claims are Presented, Use of Form PTO–1360

To assist in the computation of the fees for multiple dependent claims, a separate "Multiple Dependent Claim Fee Calculation Sheet," form PTO–1360, has been designed for use with the current "Patent Application Fee Determination Record," form PTO–875. Form PTO–1360 will be placed in the file wrapper by the Application Division where multiple dependent claims are in the application as filed. If multiple dependent claims are not included upon filing, but are later added by amendment, the examining group clerical staff will place the form in the file wrapper. If there are multiple dependent claims in the application, the total number of independent and dependent claims for fee purposes will be calculated on form PTO–1360 and the total number of claims and number of independent claims will then be placed on form PTO–875 for final fee calculation purposes.

If at least $65 is included with the application on filing, but the total fee is insufficient, a "Notice of Insufficient Fee," form PTO–1094, is placed in the file wrapper by the Application Division as is currently done. The notice will be mailed by the examining group in accordance with established procedures.

Calculating Fees for Multiple Dependent Claims

Proper Multiple Dependent Claims

Amended section 41(a) of title 35, U.S.C., provides that claims in multiple dependent form cannot be considered as single dependent claims for the purpose of calculating fees. Thus, a multiple dependent claim would be considered to be that number of dependent

claims to which it refers. Any proper claim depending directly or indirectly from a multiple dependent claim would also be considered as the same number of dependent claims as referred to in the multiple dependent claim from which it depends.

Improper Multiple Dependent Claim

If any multiple dependent claim is improper, Application Division may indicate that fact by placing an encircled numeral "1" in the "Dep. Claims" column of form PTO–1360. The fee for any improper multiple dependent claim, whether it is defective for not being in the alternative form or for being directly or indirectly dependent on a prior multiple dependent claim, will only be one, since only an objection to the form of such a claim will normally be made.

This procedure also greatly simplifies the calculation of fees. Any claim depending from an improper multiple dependent claim will also be considered to be improper and be counted as one dependent claim.

FEE CALCULATION EXAMPLE

Claim Number	
1	Independent
2	Dependent on claim 1
3	Dependent on claim 2
4	Dependent on claim 2 or 3
5	Dependent on claim 4
6	Dependent on claim 5
7	Dependent on claim 1 or 4
8	Dependent on claim 1 or 5
9	Dependent on claim 8
10	Independent
11	Dependent on claim 1 or 10
12	Dependent on claim 1 and 10

FORM PTO-1360 (1/78) U.S. DEPT. COMM. PAT. AND TMK. OFF.

MULTIPLE DEPENDENT CLAIM FEE CALCULATION SHEET (FOR USE WITH FORM PTO-875)

	AS FILED		AFTER 1ST AMDT		AFTER 2ND AMDT	
	IND.	DEP.	IND.	DEP.	IND.	DEP.
1	1					
2		1				
3		1				
4		2				
5		2				
6		2				
7		(1)				
8		(1)				
9		(1)				
10	1					
11		2				
12		(1)				
TOTAL IND.	2					
TOTAL DEP.	14	↵		↵		↵
TOTAL CLAIMS	16					

Comments on Fee Calculation Example

Claim 1.—This is an independent claim; therefore, a numeral "1" is placed opposite claim number 1 in the "Ind." column.

Claim 2.—Since this is a claim dependent on a single independent claim, a numeral "1" is placed opposite claim number 2 in the "Dep." column.

Claim 3.—Claim 3 is also a single dependent claim, so a numeral "1" is placed in the "Dep." column.

Claim 4.—Claim 4 is a proper multiple dependent claim. It refers directly to two claims in the alternative, namely, claims 2 or 3. Therefore, a numeral "2" to indicate direct reference to two claims is placed in the "Dep." column opposite claim number 4.

Claim 5.—This claim is a singularly dependent claim depending from a multiple dependent claim. For fee calculation purposes, such a claim is counted as being that number of claims to which direct reference is made in the multiple dependent claim which it depends. In this case, the multiple dependent claim number 4 it depends from counts as 2 claims; therefore, claim 5 also counts as 2 claims. Accordingly, a numeral "2" is placed opposite claim number 5 in the "Dep." column.

Claim 6.—Claim 6 depends indirectly from a multiple dependent claim 4. Since claim 4 counts as 2 claims, claim 6 also counts as 2 dependent claims. Consequently, a numeral "2" is placed in the "Dep." column after claim 6.

Claim 7.—This claim is a multiple dependent claim since it refers to claims 1 or 4. However, as can be seen by looking at the "2" in the "Dep." column opposite claim 4, claim 7 directly depends from a multiple dependent claim. This practice is improper under 35 U.S.C. 112 and Rule 1.75(c). Following the procedure for calculating fees for improper multiple dependent claims, a numeral "1" is placed in the "Dep." column with a circle drawn around it to alert the examiner that the claim is improper.

Claim 8.—This claim is a multiple dependent claim since it refers to claims 1 or 5. However, since claim 5 depends from multiple dependent claim 4, claim 8 indirectly depends from multiple dependent claim 4 through claim 5. This practice is improper. See MULTIPLE DEPENDENT CLAIMS, paragraph 2, above. Consequently, a numeral "1" is placed in the dependent claim column with a circle drawn around it.

Claim 9.—Claim 9 is improper since it depends from an improper claim. If the base claim is in error, this error cannot be corrected by adding additional claims depending therefrom. Therefore, a numeral "1" with a circle around it is placed in the "Dep." column.

Claim 10.—Here again we have an independent claim which is always indicated with a numeral "1" in the "Ind." column opposite the claim number.

Claim 11.—This claim refers to two independent claims in the alternative. A numeral "2" is therefore placed in the "Dep." column opposite claim 11.

Claim 12.—Claim 12 is a dependent claim which refers to two claims in the conjunctive ("1 *and* 10") rather than in the alternative ("1 *or* 10"). This form is improper under 35 U.S.C. 112 and Rule 1.75(c). Accordingly, since claim 12 is improper, an encircled numeral "1" is placed in the "Dep." column opposite claim 12.

Calculation of Filing Fee

After the numbers of "Ind." and "Dep." claims are noted on form PTO–1360, each column is added. In this example, there are 2 independent claims and 14 dependent claims or a total of 16 claims. The number of independent and total claims can then be placed on form PTO–875 and the fee calculated. In this example, the total number of claims 16 minus 10 leaves 6, which is multiplied by $2 for an additional total claim fee of $12. The total number of independent claims in the example is 2, which minus 1 is 1, which times the $10 rate is $10. The total filing fee is therefore $65 + $12 + $10, or a total of $87.

DRAWING REQUIREMENTS

Revised 35 U.S.C. 113 relaxes the previous requirements for submission of drawings on filing under certain conditions. The first sentence of 35 U.S.C. 113 does require a drawing to be submitted upon filing where such drawing is necessary for the understanding of the invention. In this situation the

lack of a drawing renders the application incomplete and as such, the application cannot be given a filing date until the drawing is received. The second sentence of 35 U.S.C. 113 deals with the situation wherein a drawing is not necessary for the understanding of the invention but the case admits of illustration and no drawing was submited on filing. The lack of the drawing in this situation does not render the application incomplete but rather is treated much in the same manner as an informality. The examiner should require such drawings in almost all such instances. Such drawings could be required during the processing of the application but do not have to be furnished at the time the application is filed. The applicant is allowed at least two months from the date of the letter requiring drawings to submit them.

Handling of Drawing Requirements Under the First Sentence of 35 U.S.C. 113

Under the revised provisions the Application Division examiner will continue to make the initial decision in all new applications as to whether a drawing is "necessary" under the first sentence of 35 U.S.C. 113.

If during examination an examiner feels that a filing date should not have been granted in an application because it does not contain drawings, the matter will be brought to the attention of the Supervisory Primary Examiner (SPE) for review. If the SPE decides that drawings are required to understand the subject matter of the invention, the SPE will return the application to the Application Division with a memorandum requesting cancellation of the filing date and identifying the subject matter required to be illustrated.

Handling of Drawing Requirements Under the Second Sentence of 35 U.S.C. 113

35 U.S.C. 113 also deals with the situation wherein the drawing is not necessary for the understanding of the invention, but the subject matter admits of illustration by a drawing and the applicant has not furnished a drawing. The lack of the drawing in this situation does not render the application incomplete but rather is treated as an informality. A filing date will be accorded with the original presentation of the papers, despite the absence of drawings. In these situations, a drawing or further illustration will normally be required by the examiner. This may be done either prior to examination in a separate letter or in the first Office action and may be handled in much the same manner as informal photocopy drawings are presently handled. The examiner should require drawings where appropriate as early as possible, since the possession of the drawing at that time would facilitate the examination process. A letter requiring drawings may contain wording similar to the following:

> "The examiner has decided that the subject matter of this application admits of illustration by a drawing and that a drawing would facilitate the understanding of the subject matter disclosed. (Continue with a specific mention of those items of which drawings are desired.) Applicant is required to furnish a drawing under 37 CFR 1.81. (Incorporate in Office action or set two-month period for response.)"

The applicant will be given at least two months from the date of such requirement to submit drawings. If the requirement for drawings is included in an Office action, the time for supplying the drawings will be the same as the time of response to the Office action. Upon receipt of the drawing within the period set, the examiner will check the drawings for new matter. If new matter is included, the drawing will not be entered. It will be objected to as containing new matter. A new drawing without such new matter may be required if the examiner still feels a drawing is needed under 37 CFR 1.81 or 1.83. The examiner's decision would be reviewable by petition to the Commissioner under Rule 1.181. The decision on such a petition would be handled by the Group Director. If a drawing is not timely received in response to a letter from the examiner which requires a drawing, the application becomes abandoned for failure to respond.

Date Feb. 8, 1978. RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

[968 OG 7]

EXAMINATION OF APPLICATIONS

(48) INFORMAL APPLICATIONS OF FOREIGN APPLICANTS

This Notice is of special interest to attorneys and agents prosecuting applications on inventions originating abroad.

Many applications filed in this Office correspond in form and substance to the requirements (regulations) of countries foreign to the United States. Since they were not originally drafted to comply with our Rules of Practice, especially those based on 35 U.S.C. 112, the first examination cannot be the full and complete one contemplated under current examining procedures. This first examination is necessarily limited, under MPEP 702.01, to pointing out the informalities and citing the results of a search, the search being based upon the invention so far as it can be understood from the foreign type of claims, often coupled with a somewhat generalized disclosure. Since U.S. Patent Office policy is to accord equal treatment to *all* cases regardless of origin, current examining procedures as explained in the address reprinted in 803 O.G. 893, subject these applications to final determination on the second action. It is obviously to applicant's advantage to *file* the application with an adequate disclosure and with claims which conform to the U.S. Patent Office usages and requirements. This should be done whenever possible. If, however, due to the pressure of a Convention deadline or other reasons, this is not possible, applicants are urged to submit *promptly, preferably within three months after filing,* a preliminary amendment which corrects the obvious informalities. The informalities should be corrected to the extent that the disclosure is readily understood and the claims to be initially examined are in proper form, particularly as to dependency, and otherwise clearly define the invention. "New matter" must be excluded from these amendments since preliminary amendments do not enjoy original disclosure status, section 608.04(b), MPEP.

EDWARD J. BRENNER,
Mar. 4, 1965. *Commissioner of Patents.*

[812 O.G. 1295]

(49) EXAMINATION OF CLAIMS FOR PATENTABILITY UNDER 35 U.S.C. 103

The purpose of this notice is to inform the public of the current Patent and Trademark Office policy concerning determinations of obviousness under 35 U.S.C. 103 in view of the recent Supreme Court decision in *Sakraida* v. *Ag Pro,* 189 USPQ 449 (1976).

The following text is a copy of a memorandum issued to all patent examining personnel relative to this topic.

"A clarification of the policy of the Patent and Trademark Office in the examination of claims for patentability under 35 U.S.C. 103 seems in order at this time in view of the Supreme Court's decision in *Sakraida* v. *Ag Pro,* 189 USPQ 449 (decided April 20, 1976) which is similar to the Court's earlier decision in *Anderson's-Black Rock, Inc.* v. *Pavement Salvage Co.,* 163 USPQ 673 (decided December 8, 1969).

"Office policy has consistently been to follow *Graham* v. *John Deere Co.,* 148 USPQ 459 (decided February 21, 1966) in the consideration and determination of obviousness under 35 U.S.C. 103. The three factual inquiries enunciated therein as a background for determining obviousness are as follows:

1. Determination of the scope and content of the prior art;
2. Ascertaining the differences between the prior art and the claims in issue; and
3. Resolving the level of ordinary skill in the pertinent art.

"Attention is directed to MPEP Section 706 for a more complete discussion of the application of the Graham test.

"The Supreme Court reaffirmed and relied upon the Graham three-pronged test in its consideration and determination of obviousness in the fact situations presented in both the Ag Pro and Black Rock decisions. In each case, the Court went on to discuss whether the claimed combinations produced a 'new or different function' and a 'synergistic result,' but clearly decided whether the claimed inventions were unobvious on the basis of the three-way test in Graham. No-

where in its decisions in those cases does the Court state that the 'new or different function' and 'synergistic result' tests supersede a finding of unobviousness or obviousness under the Graham test.

"Accordingly, examiners should continue to apply the test for patentability under 35 U.S.C. 103 set forth in Graham. It should be noted that the Supreme Court's application of the Graham test to the fact circumstances in Ag Pro is somewhat stringent, as it was in Black Rock."

July 8, 1976.

C. MARSHALL DANN,
Commissioner of Patents & Trademarks.

[949 O.G. 3]

(50) CLAIMS COPIED FROM PATENTS

Applicants and their attorneys or agents are reminded of the requirement of Rule 205(b) (37 CFR 1.205(b)) of the Rules of Practice that "Where an applicant presents a claim copied or substantially copied from a patent, he must, at the time he presents the claim, identify the patent, give the number of the patented claim, and specifically apply the terms of the copied claim to his own disclosure, unless the claim is copied in response to a suggestion by the Office."

The requirement of Rule 205(b) (37 CFR 1.205(b)) applies to claims copied in an application at the time of filing as well as to claims copied in an amendment to a pending application. If an applicant, attorney, or agent presents a claim copied or substantially copied from a patent without complying wtih Rule 205(b) (37 CFR 1.205(b)) the examiner may be led into making an action different from what he would have made had he been in possession of all the facts. Therefore, failure to comply with Rule 205(b) (37 CFR 1.205(b)), when submitting a claim copied from a patent, may result in the issuance of an Order To Show Cause why the application should not be stricken from the files of the Patent Office. If a satisfactory answer is not filed within the period set in the Order it may be necessary to strike the application under Rule 56 (37 CFR 1.56).

This reminder is being published to emphasize to applicants and their attorneys or agents the importance of complying with the requirement of Rule 205(b) (37 CFR 1.205(b)) at the time the claim is copied.

WILLIAM FELDMAN,
Apr. 10, 1974. *Acting Assistant Commissioner for Patents.*

[922 O.G. 442]

(51) EXAMINATION OF PATENT APPLICATIONS HAVING AN ISSUE OF FRAUD

This notice deals with the general procedures established within the Patent Office for the handling, during ex parte examination, of applications in which, or in relation to which, some facts appear or representations are made raising an issue of fraud.

Such applications should be forwarded by the examiner to the Office of the Assistant Commissioner for Patents as soon as the facts or representations are discovered. The application will then be reviewed and a determination made as to whether immediate action on the issue of fraud is necessary or whether the consideration of such an issue should be delayed until after the normal ex parte examination by the examiner (if such examination has not previously taken place).

Where compelling reasons dictate immediate action, the application will not be returned to the examining group for normal ex parte examination until such action is complete. Otherwise, the application will be returned to the examining group. The examiner will complete the examination as to all matters except that any issues relating to possible fraud will not be considered or commented upon. When this examination is completed the application will be returned to the Office of the Assistant Commissioner for Patents. An investigation will then be undertaken to resolve the issues relating to the possible fraud. Such an investigation may include a requirement for additional information from applicant, or from the examiner, should it be necessary for the proper conduct of the investigation.

If the investigation reveals a prima facie case of fraud an Order to Show Cause why the application should not be stricken under Rule 56 of the Rules of Practice [37 CFR 1.56] will be issued.

If a prima facie case of fraud does not exist, or is adequately rebutted, a decision will be entered in the application file stating that the Patent Office has found no evidence necessitating striking the application. The application will then be returned to the examining group or other appropriate Patent Office section for further action.

WILLIAM FELDMAN,
Jan. 2, 1975. *Acting Assistant Commissioner for Patents.*

[930 O.G. 1455]

(52) RESTRICTION BETWEEN INVENTIONS

The practice set out in the notice of June 20, 1968 (852 O.G. 509) is hereby revised as follows.

Under the statute an application may properly be required to be restricted to one of two or more claimed inventions only if they are able to support separate patents and they are either independent or distinct.

If it is demonstrated that two or more claimed inventions have no disclosed relationship ("independent"), restriction should be required, and it is not necessary to further show that the claimed inventions are distinct. If it is demonstrated that two or more claimed inventions have a disclosed relationship ("dependent"), then a showing of distinctness is required to substantiate a restriction requirement.

Where inventions are neither independent nor distinct, one from the other, or they are not sufficiently different to support more than one patent, their joinder in a single application must be permitted.

Every requirement to restrict has two aspects, (1) the reasons (as distinguished from the mere statement of conclusion) why the inventions *as claimed* are either independent or distinct, and (2) the reasons for insisting upon restriction therebetween.

In order to support a requirement to restrict between combination and subcombination inventions, two-way distinctness must be demonstrated.

If it can be shown that a combination, as claimed (1) does not require the particulars of the subcombination as claimed for patentability, and (2) the subcombination can be shown to have utility either by itself or in other and different relations, the inventions are distinct. When these factors cannot be shown, such inventions are not distinct.

Two or more claimed subcombinations, disclosed as usable together in a single combination, and which can be shown to be separately usable, are usually distinct from each other.

In applications claiming inventions in different statutory categories only one-way distinctness is needed to support a restriction requirement. For example, in applications containing claims to both process and apparatus, distinctness may be shown if (1) the process as claimed can be practiced by hand or by another materially different apparatus, or (2) the apparatus as claimed can be used to practice another and materially different process.

As in the notice of May 1, 1974 concerning Markush-Type claims (922 O.G. 1016), if the search and examination of an entire application can be made without serious burden, the examiner is encouraged to examine it on the merits, even though it includes claims to distinct or independent inventions.

WILLIAM FELDMAN,
Apr. 9, 1975. *Deputy Assistant Commissioner for Patents.*

[934 O.G. 450]

(53) REVISED PRACTICE RE MARKUSH-TYPE CLAIMS

This notice deals with Markush-type generic claims which include a plurality of alternatively usable substances or members. In most cases, a recitation by enumeration is used because there is no appropriate or true generic language. In many cases, the Markush-type claims include independent and distinct inventions. This is true where two or more of the members are so unrelated and diverse that a prior art

reference anticipating the claim with respect to one of the members would not render the claim obvious under 35 U.S.C. 103 with respect to the other member(s).

In applications containing claims of that nature, the Examiner may require a provisional election of a single species prior to examination on the merits. The provisional election will be given effect in the event that the Markush-type claim should be found not allowable. Following election, the Markush-type claim will be examined fully with respect to the elected species and further to the extent necessary to determine patentability. Should the Markush-type claim be found not allowable, examination will be limited to the Markush-type claim and claims to the elected species, with claims drawn to species patentably distinct from the elected species held withdrawn from further consideration.

As an example, in the case of an application with a Markush-type claim drawn to the compound C-R, wherein R is a radical selected from the group consisting of A, B, C, D, and E, the Examiner may require a provisional election of a single species, CA, CB, CC, CD, or CE. The Markush-type claim would then be examined fully with respect to the elected species and any species considered to be clearly unpatentable over the elected species. If on examination the elected species is found to be anticipated or rendered obvious by prior art, the Markush-type claim and claims to the elected species shall be rejected, and claims to the non-elected species would be held withdrawn from further consideration. As in the prevailing practice, a second action on the rejected claims would be made final.

On the other hand, should no prior art be found that anticipates or renders obvious the elected species, the search of the Markush-type claim will be extended. If prior art is then found that anticipates or renders obvious the Markush-type claim with respect to a *non-elected species*, the Markush-type claim shall be rejected and claims to the non-elected species held withdrawn from further consideration. The prior art search, however, will not be extended unnecessarily to cover all non-elected species. Should applicant, in response to this rejection of the Markush-type claim, overcome the rejection, as by amending the Markush-type claim to exclude the species anticipated or rendered obvious by the prior art, the amended Markush-type claim will be re-examined. The prior art search will be extended to the extent necessary to determine patentability of the Markush-type claim. In the event prior art is found during the re-examination that anticipates or renders obvious the amended Markush-type claim, the claim will be rejected and the action made final. Amendments submitted after the final rejection further restricting the scope of the claim will not be entered.

If the members of the Markush group are sufficiently few in number or so closely related that a search and examination of the entire claim can be made without serious burden, the Examiner is encouraged to examine all claims on the merits, even though they are directed to independent and distinct inventions. In such a case, the Examiner will not follow the above procedure and will not require restriction.

This notice supersedes the practice set out in 922 O.G. 1016, dated May 1, 1974.

Although the above practice is now in effect, a rule change proposal is also being considered to provide for prosecution of multiple inventions in a single patent application by submission of additional fees.

DONALD W. BANNER,

Oct. 23, 1978. *Commissioner of Patents and Trademarks.*

[976 OG 128]

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(54) REVISED PROCEDURES FOR RECORDING SEARCHES AND CONSIDERATIONS OF CERTAIN PRIOR ART

In order to provide a more complete, accurate and uniform record of what has been searched and considered by the examiner for each application the Patent and Trademark Office has established revised procedures for recording search data in the application file. Such a record is of importance to anyone evaluating the strength and validity of a patent, particularly if the patent is involved in litigation. These new procedures will also facilitate the printing of certain search data on patents.

Under the revised procedures, searches are separated into two categories and listed, as appropriate, in either the "SEARCHED" box or a newly added "SEARCH NOTES" box on the file jacket.

Until file jackets can be reprinted to include a second search data box, all file jackets for new applications will have the "SEARCH NOTES" box stamped therein by the Mail Room. If additional space is required, entries will be continued on the outside right flap of the file jacket.

The revised procedures will apply to all new applications in which the first search is made after April 1, 1977 and do not affect the manner in which references are listed on the form PTO–892, "Notice of References Cited." Appropriate changes in the Manual of Patent Examining Procedure will be made.

A. "SEARCHED" Box Entries

Search entries made here, except those for search updates (see item A. 3 below), will be printed under "Field of Search" on the patent front page. Therefore, the following searches will be recorded in the "SEARCHED" box by the examiner along with the date and the examiner's initials, according to the following guidelines:

1. *A complete search of a subclass,* including all United States and foreign patent documents and other publications placed therein.
   The complete classification (class and subclass) will be recorded.
2. *A limited search of a subclass,* for example, a search that is restricted to an identifiable portion of the patent documents placed therein. If, however, only the publications in a subclass are searched, such an entry is to be made under "SEARCH NOTES" rather than under "SEARCHED." (See item B. 4 below.)
   The class and subclass, followed by the information defining the portion of the subclass searched in parenthesis, will be recorded.
3. *An update of a search previously made.*
   This search entry will be recorded in a manner to indicate clearly which of the previously recorded searches have been updated, followed by the expression "(updated)." Search update, entries, although recorded in the "SEARCHED" box, will not be printed.
   When a search made in a parent application is updated during the examination of a continuing application, those searches updated, followed by "(updated from parent S.N. ————————)" will be recorded. If the parent has been patented, the patent number "Pat. N. ————————" instead of serial number in the above phrase will be recorded.
4. *A mechanized search* of a file of documents in a specific art, conducted by using key terms to retrieve documents. The name of the mechanized search system as it appears in the following list will be recorded along with the expression "MS File" to indicate mechanized search file.

Mechanized Search Systems

Termatrex Systems:

Automatic Fuel Controls
Boots & Shoes
Chemical Testing
Combined Fasteners
Electrical Contact Materials
Surface Bonding Using Critical Metal

Edge-Notched Card System:

Fluid Devices

Punch Card Systems:

Electrolysis
Organometallics
Steroids

Computer Controlled Microfiche Search Systems (CCMSS):

A-D Convertors
Digital Data Processing Systems
Special Purpose Digital Processing Systems

When a search with a Termatrex or Edge-Notched card system is conducted, the examiner will complete form PTO–1041 in two copies, recording all queries searched,

even those which yield only non-relevant documents. All documents returned by the system in response to a query which are not actually reviewed will have an "X" drawn through their associated access and patent numbers. The examiner will place one copy of the form PTO–1041 in the application file on the right flap of the file jacket, the other copy of the form PTO–1041 will be forwarded to the Office of Search Systems.

When conducting a search with a Punched Card system, the examiner will place in the application file the Code Sheet on which the terms searched have been marked along with the machine tape listing the documents retrieved. Any document not actually reviewed will have an "X" drawn through that document's number on the listing.

When conducting a search with the CCMSS search systems, the machine-produced search report, which lists the terms and tagged documents, will be placed in the application file on the right flap of the file jacket. Any tagged document not actually reviewed will have an "X" drawn through that document number on the search report.

B. *"SEARCH NOTES" Box Entries*

Entries made in the "SEARCH NOTES" box are of equal importance to those placed in the "SEARCHED" box; however, these entries will not be printed on any resulting patent. They are intended to complete the application file record of areas and/or documents considered by the examiner in the search. The examiner will record the following searches in the "SEARCH NOTES" box and in the manner indicated, with each search dated and initialled:

1. *A cursory search*, or scanning, of a subclass, i.e., a search usually made to determine if the documents classified there are relevant.

   The classification will be recorded, followed by "(Cursory)."
2. *A consultation* with other examiners to determine if relevant search fields exist in their areas of expertise.
   The class and subclass discussed, if not actually searched, will be recorded, followed by "(consulted)." This entry may also include the name of the examiner consulted and the art unit.
3. *A search of a publication* not located within the classified patent file, e.g., a library search, a text book search, a Chemical Abstracts search, etc. The following data will be recorded for each type of literature search:
   a. *Abstracting publications*, such as Chemical Abstracts or the Engineering Index—the name of the publication, the list of terms consulted in the index and the period covered will be recorded.
   b. *Periodicals*—The title and period or volumes covered, as appropriate will be recorded.
   c. *Books*—The title and author, edition or date, as appropriate, will be recorded.
   d. *Other types of literature* not specifically mentioned above (i.e., catalogs, manufacturer's literature, private collections, etc.).

   Unless the search is a cursory or browsing one, data as necessary to provide unique identification of material searched will be recorded. Specific materials cited by the examiner will not be recorded again here.
   e. *Computer search in Scientific Library*—An on-line computerized literature searching service which uses key terms and index terms to locate relevant publications in many large bibliographic data bases is available to examiners in the Scientific Library of the Patent and Trademark Office. A member of the library staff is assigned to assist examiners in selecting key terms and to program the search.

   There are two on-line search systems: The Lockheed Information Systems and the SDC Search Service.

   These search systems include many data bases.

   A copy of the search printout will be made and placed in the application file, attached to the right flap of the file jacket.

   The examiner will also indicate which publications were reviewed by initialling and dating the copy of the printout in the left margin adjacent to each reviewed publication. If only an abstract of a document was reviewed, the note of "ck'ed abst." will be made next to the initials and date. If the complete document was reviewed, the note "ck'ed doc." will be placed with the initials and date.
4. A search of only the *publications in a subclass*.
   The class and subclass followed by "(publications only)" will be recorded.
5. *A review of art cited in a parent application* or in an original patent, as required for all continuing and reissue applications, or a review of art cited in related applications or patents mentioned within the specification, such as those included to provide background of the invention.

   The serial number of a parent application that is still pending or abandoned, followed by "refs. checked" or "refs. ck'ed" will be recorded. If for any reason not all of the references are checked because they are not available or clearly not relevant, such exceptions will be noted.

   The patent number of a parent or related application that was patented or of an original patent now being reissued will be recorded along with the expressions "refs. checked" or "refs. ck'ed."

C. *Not Recorded*

The following data will not be recorded in either of the search boxes, but will be noted in the application file as indicated below.

1. *Citations of prior art by applicants conforming to Rule 98 and the practice thereunder.*
   In each instance where all prior art referred to in a paper placed in the application file is considered, the examiner will place the notation "all ck'ed" and his or her initials adjacent to the citation.
2. *Citations of prior art by applicants not conforming to Rule 98 and the practice thereunder.*
   In each instance where an examiner considers, but does not cite on form PTO–892, specific prior art referred to in a paper placed in the application file, the examiner will place a notation adjacent to the reference. If all the references referred to in such a paper are reviewed, the examiner will place the notation "all ck'ed" and his or her initials adjacent the citation. If included in the specification, the examiner will write his or her initials adjacent to any reference(s) checked and enter "checked" or "ck'ed" in the left margin opposite the initials. If presented in a separate paper or in the remarks of an amendment, the examiner's initials and "checked" or "ck'ed" will be entered adjacent to the citation(s) or wherever possible to indicate clearly those checked.

RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

Date: 2–22–77.

[956 O.G. 1546]

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(55) "MERE FUNCTION OF MACHINE"—REJECTION

In view of the decision of the Court of Customs and Patent Appeals in *In re Tarczy-Hornoch* appearing at 158 USPQ 141, process or method claims will no longer be subject to a rejection by Patent Office examiners solely on the ground that they define the inherent function of a disclosed machine or apparatus. Accordingly, the subject matter of MPEP 706.03(r) is inapplicable and hereby cancelled.

RICHARD A. WAHL,
Assistant Commissioner.

Feb. 10, 1969.

[861 O.G. 343]

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(56) EXPRESS ABANDONMENTS

Experience over the past several months has indicated the need to clarify and re-emphasize existing practice regarding express abandonments submitted under 37 CFR 1.138.

Since 1966, when Rule 138 was revised, it is no longer required that the applicant and the assignee of record, if any, sign an express abandonment. The revised rule indicates that a patent application may be expressly abandoned by an at-

torney or agent of record. Therefore, prior to signing a declaration of express abandonment of a patent application, it is imperative that the attorney or agent of record exercise every precaution in ascertaining that the abandonment of the application is in accordance with the desires and best interests of the applicant. Moreover, special care should be taken to insure that the appropriate application from a group of related applications is correctly identified in the letter of abandonment.

A declaration of abandonment signed by the applicant or his attorney or agent of record becomes effective when an appropriate official of the Office takes action in recognition of the declaration. When so recognized, the date of abandonment may be the date of recognition or a different date if so specified in the declaration itself. For example, where a continuing application is filed with a request to abandon the prior application as of the filing date accorded the continuing application, the date of the abandonment of the prior application will be in accordance with the request once it is recognized.

Action in recognition of an express abandonment may take the form of an acknowledgement by the examiner or the Patent Issue Division of the receipt of the express abandonment, indicating that it is in compliance with 37 CFR 1.138 (see Section 711.01 MPEP). Alternatively, recognition may be no more than the transfer of drawings to a new application pursuant to instructions which include a request to abandon the application containing the drawings to be transferred (see 37 CFR 1.60 and Section 608.02(1) MPEP).

It is suggested that divisional applications being submitted under 37 CFR 1.60 be reviewed before filing to ascertain whether the prior application should be abandoned. Recent experience reveals that some divisional applications are being filed under 37 CFR 1.60 with requests to transfer the drawings from, and abandon, the prior application. Following the recognition of the abandonment, the attorney or agent signing the request informs the Office that the request was made by mistake for any one of a number of reasons. Care should be exercised in situations such as these as the Office looks on express abandonments as acts of deliberation, intentionally performed.

Another common situation involves the submission of an express abandonment following the allowance of an application. The express abandonment may not be recognized unless it is actually received by appropriate officials in time to act before the date of issue. In those cases, once a patent number and issue date have been assigned to the application, it is considered too late to act on the express abandonment unless a petition under Rule 313(b) or Rule 183 is granted (see Section 711.01 of MPEP).

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

Apr. 7, 1975.

[934 O.G. 2]

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(57) NOTICE OF ABANDONMENT FOR FAILURE TO PROSECUTE APPLICATION

Effective immediately the Patent Examining Corps will mail a communication, concerning all applications becoming abandoned in the Corps for failure to prosecute, to the correspondence address of record.

The communication to be mailed will merely comprise a copy of the first page of the Office action, to which applicant failed to properly respond, the copy including stamped language thereon indicating that the application has become abandoned and the date that the copy was mailed. The language stamped on the copy will be as follows: APPLICATION HAS BECOME ABANDONED. THIS NOTICE MAILED: ————————. In no case will the mere failure to receive a notice of abandonment affect the status of an abandoned application.

This new procedure should enable applicants to take appropriate and diligent action to reinstate an application inadvertently abandoned for failure to timely respond to an official communication. In most cases, a petition to revive under 37 CFR 1.137 will be the appropriate remedy. It may be that a response to the Office action was mailed to the Office with a certificate of mailing declaration as a part thereof (notice of October 26, 1976; 951 O.G. 1342) but was not received in the Office. In this instance, adequate relief may be available by means of a petition to withdraw the holding of abandonment.

In any instance, if action is not taken promptly after receiving the notice of abandonment, appropriate relief may not be granted.

If a lack of diligent action is predicated on the contention that neither the Office action nor the notice of abandonment was received, one may presume that there is a problem with the correspondence address of record. Accordingly, your attention is directed to recent notices of May 28, 1975, and September 9, 1976, dealing with changes of address (935 O.G. 1352 and 951 O.G. 454). In essence, it is imperative that a paper notifying the Office of a change of address be filed promptly in *each* application in which the correspondence address is to be changed.

If an application is abandoned or a patent lapsed for an excessive time a terminal disclaimer may be required. A terminal disclaimer may also be required where the holding of abandonment or lapse is withdrawn but a determination is made that action attempting to correct the problem should have been taken in a more diligent manner.

WILLIAM FELDMAN,
May 9, 1977. *Deputy Assistant Commissioner for Patents.*

[959 O.G. 24]

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(58) ENVIRONMENTAL QUALITY

In signing the National Environmental Policy Act on the first day of this decade, President Nixon declared, "The 1970's absolutely must be the years when America pays its debt to the past by reclaiming the purity of its air, its waters and our living environment." This landmark legislation declares that it is the continuing policy of the Federal Government to use all practicable means and measures to foster and promote the general welfare, create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans. The Act further directs that, to the fullest extent possible, the policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with the policies set forth in this Act.

In accordance with the desires of the President and this mandate of the Congress, the Patent Office will accord "special" status to all patent applications for inventions which materially enhance the quality of the environment of mankind by contributing to the restoration or maintenance of the basic life-sustaining natural elements—air, water, and soil. In order that the Patent Office may implement this procedure, we request that all applicants desiring to participate in this program request that their applications be accorded "special" status. Such requests should be written, should identify the applications by serial number and filing date, and should be accompanied by affidavits or declarations under Rule 102 explaining how their inventions contribute to the restoration or maintenance of one of these life-sustaining elements.

WILLIAM E. SCHUYLER, JR.,
Jan. 29, 1970. *Commissioner of Patents.*

[871 O.G. 673]

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(59) APPLICATIONS RELATED TO ENERGY

In his Message of April 18, 1973, to The Congress "Concerning Energy Resources," the President stated that "with 6 percent of the world's population, we consume almost a third of all the energy used in the world." The President noted that our energy demands "now outstrip our available supplies, and at our present rate of growth, our energy needs a dozen years from now will be nearly double what they were in 1970." The President's Message of April 18 called for the development of a more comprehensive, integrated national energy policy and announced specific steps to carry out the policy. On June 29, 1973, the President announced a series of additional actions to deal with the Nation's energy problem. Among those actions were major efforts in energy research and development and in energy conservation.

In order to enhance and further the goals and actions announced by the President, the Patent Office will, on request, accord "special" status to all patent applications for inventions which materially contribute to (1) the discovery or development of energy resources, and (2) the more efficient utilization and conservation of energy resources. Examples of inventions in category (1) would be those relating to further developments in fossil fuels (natural gas, coal, and petroleum), nuclear energy, solar energy, etc. Category (2) would include inventions relating to the reduction of energy consumption in combustion systems, industrial equipment, household appliances, etc. In order that the Patent Office may implement this procedure, we request that all applicants desiring to participate in this program request that their applications be accorded "special" status. Such requests should be written, should identify the application by serial number and filing date, and should be accompanied by affidavits or declarations under rule 102 by the applicant or his attorney or agent explaining how the invention materially contributes to category (1) or (2) set forth above.

Requests should be addressed to the Commissioner of Patents, Washington, D.C. 20231.

RENE D. TEGTMEYER,
Date: Oct. 26, 1973. *Acting Commissioner of Patents.*
Approved:
BETSY ANCKER-JOHNSON, Ph.D.,
Assistant Secretary for Science and Technology.

[916 O.G. 2]

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(60) NEW PROCEDURES FOR RECORDATION OF INTERVIEWS

This notice establishes within the Patent and Trademark Office additional general procedures for the recordation of interviews. Proposed procedures were published in the OFFICIAL GAZETTE of June 28, 1977 (959 O.G. 36) for comment from interested members of the public by August 10, 1977. Fifteen written comments were received the majority of which were favorable to the proposed procedures. Careful consideration has been given to the comments and the procedures are being adopted with a few changes.

Under present practice it is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability as set forth in Setion 713.04 of the Manual of Patent Examining Procedure (MPEP). This practice is continued and further amplified as set forth below.

Recent surveys have indicated that the substance of many interviews has not been made of record or the text thereof is incomplete as to substantive matters. In some cases, the substance of an interview may be presented as arguments in a subsequent response filed by the applicant but without any indication that they had been presented at the interview. In order to help insure a better record of examiner-applicant interviews in application files, the following new procedures are adopted to become effective for interviews conducted on and after January 1, 1978. Appropriate changes will be made in the Manual of Patent Examining Procedure (MPEP).

Examiners will complete a two-sheet carbon interleaf Interview Summary Form for each interview held where a matter of substance has been discussed by checking the appropriate boxes and filling in the blanks in neat handwritten form. Discussions regarding only procedural matters, directed solely to restriction requirements (for which interview recordation is otherwise provided for in Section 812.01 of the MPEP), or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below.

The Interview Summary Form shall be given an appropriate paper number, placed in the file and listed on the "Contents" list on the file wrapper. The docket and serial register cards will not be updated to reflect this interview. In a personal interview, the duplicate copy of the Form will be removed and given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephonic interview, the copy will be mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner before an allowance is not likely or if other circumstances dictate, the Form will be mailed promptly after the telephonic interview rather than with the next official communication. The original of the completed Form will be made of record and placed in the right hand flap of the file.

The Form provides for recordation of the following information:

— Serial Number of the application
— Name of applicant
— Name of examiner
— Date of interview
— Type of interview (personal or telephone)
— Name of participant(s) (applicant, attorney or agent, etc.)
— An indication whether or not an exhibit was shown or a demonstration conducted
— An identification of the claims discussed
— An identification of the specific prior art discussed
— An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). (Agreements as to allowability are tentative and do not restrict further action by the examiner to the contrary.)
— The signature of the examiner who conducted the interview
— Names of other Patent and Trademark Office personnel present.

The Form also contains a statement reminding the applicant of his responsibility to record the substance of the interview.

It is desirable that the examiner orally remind the applicant of his obligation to record the substance of the interview in each case unless both applicant and examiner agree that the examiner will record same. Where the examiner agrees to record the substance of the interview, or when it is adequately recorded on the Form or in an attachment to the Form, the examiner will check a box at the bottom of the Form informing the applicant that he need not supplement the Form by submitting a separate record of the substance of the interview.

It should be noted, however, that the Interview Summary Form will not be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview:

The complete and proper recordation of the substance of any interview should include at least the following applicable items:

1) A brief description of the nature of any exhibit shown or any demonstration conducted.
2) an identification of the claims discussed.
3) an identification of specific prior art discussed.
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the examiner.
5) a brief identification of the general thrust of the principal arguments presented to the examiner. The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he feels were or might be persuasive to the examiner.
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete or accurate, the examiner will take appropriate action as set forth in MPEP Section 713.04. If the record is complete and accurate, the examiner should place the indication "Interview record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

C. MARSHALL DANN,
Aug. 30, 1977. *Commissioner of Patents and Trademarks.*

[962 O.G. 21]

(61) STATEMENTS FILED UNDER ATOMIC ENERGY ACT AND NASA ACT

Attention is called to the provisions of section 152 of the Atomic Energy Act of 1954 (42 U.S.C. 2182) and section 305(c) of the National Aeronautics and Space Act of 1958 (42 U.S.C. 2457). These statutes provide that the title to inventions useful in the production or utilization of special nuclear material or atomic energy, made or conceived in the course of or under any contract, subcontract, or arrangement entered into with or for the benefit of the Atomic Energy Commission, and any invention made in the performance of any work under any contract of the National Aeronautics and Space Administration, shall be vested in the United States. They also provide that no patent may be granted for any invention useful in the production or utilization of special nuclear material or atomic energy, or which in the opinion of the Commissioner has significant utility in the conduct of aeronautical or space activities, unless the applicant files with his application or within 30 days after request therefor by the Commissioner, a statement under oath setting forth (*a*) the full facts in regard to the making or conception of the invention, and (*b*) the situation with regard to the contractual relationships involving the Commission or the Administration. Careful attention should be given the exact wording of the requirements of whichever of these sections is pertinent in order to assure that all of the requirements are met. Since the duty of requiring the statements is placed by law on the Commissioner of Patents, it is incumbent on the Commissioner to determine whether the statements are timely filed and sufficient in substance to comply. Since these laws do not provide for any extension of the 30-day period or for reviving an application which has become abandoned for failure to file a proper statement, it is important that such statements be timely filed and that they do so comply in order to avoid loss of valuable patent rights.

The "full facts" involved in the conception and making of an invention should include those which are unique to that invention. The use of form paragraphs or printed forms which set forth only broad generalized statements of fact is not ordinarily regarded as meeting the requirements of these statutes.

This office has construed the word "applicant" in both of these statutes to mean the inventor or joint inventors in person. Accordingly, in the ordinary situation, the statements must be signed by the inventor or joint inventors, if available. This construction is consistent with the fact that no other person could normally be more knowledgeable of the "full facts concerning the circumstances under which such invention was made," (42 U.S.C. 2457) or, "full facts surrounding the making or conception of the invention or discovery" (42 U.S.C. 2182).

In instances where an applicant does not have first-hand knowledge whether the invention involved work under any contract, subcontract, or arrangement with or for the benefit of the Atomic Energy Commission, or had any relationship to any work under any contract of the National Aeronautics and Space Administration, and includes in his statement information of this nature derived from others, his statement should identify the source of his information. Alternatively, the statement by the applicant could be accompanied by a supplemental declaration or oath, as to the contractual matters, by the assignee or other person, e.g., an employee thereof, who has the requisite knowledge.

Where an applicant is deceased or incompetent, or where it is shown to the satisfaction of this Office that he refuses to furnish a statement or cannot be reached after diligent efforts, declarations or statements under oath setting forth the information required by the statutes may be accepted from an officer or employee of the assignee who has sufficient knowledge of the facts. The offer of such substitute statements should be based on the actual unavailability of or refusal by the applicant, rather than mere inconvenience. Where it is shown that one of joint inventors is deceased or unavailable, a statement by all of the other joint inventor(s) may be accepted.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

Aug. 13, 1973.

[914 O.G. 2]

(62) EXTENSIONS OF TIME TO SUBMIT AFFIDAVITS AFTER FINAL REJECTION

Not infrequently, applicants request an extension of time, stating as a reason therefor that more time is needed in which to submit an affidavit. When such a request is filed after final rejection, the granting of the request for extension of time is without prejudice to the right of the examiner to question why the affidavit is now necessary and why it was not earlier presented. If applicant's showing is insufficient, the examiner may deny entry of the affidavit, notwithstanding the previous grant of an extension of time to submit it. The grant of an extension of time in these circumstances serves merely to keep the case from becoming abandoned while allowing the applicant the opportunity to present the affidavit or to take other appropriate action. Moreover, prosecution of the application to save it from abandonment must include such timely, complete and proper action as required by 37 CFR 1.113. The admission of the affidavit for purposes other than allowance of the application, or the refusal to admit the affidavit, and any proceedings relative thereto, shall not operate to save the application from abondonment.

Implicit in the above practice is the fact that affidavits submitted after final rejection are subject to the same treatment as amendments submitted after final rejection. *In re Affidavit Filed After Final Rejection,* 152 USPQ 292, 1966 C.D. 53.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

July 25, 1977.

[961 O.G. 16]

(63) EXTENSION OF TIME LIMIT

This notice is intended to clarify certain misunderstandings and indicates the treatment given to requests for an extension of time in a situation where applicant has been given a time limit to complete an otherwise incomplete but bona fide attempt to respond to the previous Office action and advance the case to final action.

According to 37 CFR 1.135(c) when the applicant has filed a response to an examiner's action but consideration of some matter or compliance with some requirement has been inadvertently omitted, an opportunity to explain and supply the omission may be given before the question of abandonment is considered. According to the M.P.E.P., Section 710.02(c), the examiner may give applicant one month or the remainder of the period for response, whichever is longer, to complete the response. Neither the regulation nor the M.P.E.P. indicate that this time can be extended.

Under the regulation, the missing matter or lack of compliance must be considered by the examiner as being "inadvertently omitted." Once an inadvertent omission is brought to the attention of the applicant, the question of inadvertence no longer exists. Therefore, any further time to complete the response would not be appropriate under 37 CFR 1.135(c). Accordingly, no extension of time will henceforth be granted in these situations.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

Nov. 28, 1977.

[965 O.G. 14]

(64) TRANSLATIONS OF FOREIGN LANGUAGE REFERENCES

Frequently, Office actions cite references that are in a foreign language. In the event a translation of the entire text or portion of the text of the reference is readily available in the examiners' search files, a copy of the translation will normally be included with the Office action. However, applicants are cautioned that the inclusion of a translation with a foreign language reference should not be construed to mean that the examiner used or relied on the translation, or that it is accurate or an official translation made by the Patent and Trademark Office.

While this service may be infrequent, it could be increased by the submission of translations by the applicant to the Office. Accordingly, it is requested that translations of foreign language references be transmitted to the Office, and in particular be transmitted with the response to the Office action

or in a separate envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231. In addition, it would be of great assistance to the Office in filing the translation, if the translation carried the following: 1. an identification of the foreign language reference and, where possible, 2. its location in the examiners' search files (e.g. location should be known if reference was cited in Office action). If identifying information is not available, the incoming translation should carry the name "Scientific Library" thereon so that it can be processed by the Library.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

Date: Oct. 26, 1977.

[964 O.G. 24]

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(65) TITLE 37—PATENTS, TRADEMARKS AND COPYRIGHTS

CHAPTER 1—PATENT AND TRADEMARK OFFICE, DEPARTMENT OF COMMERCE

PART 1—RULES OF PRACTICE IN PATENT CASES

Patent Examining and Appeal Procedures

On October 4, 1976 notice was given in the Federal Register (41 FR 43729) of a proposal to amend sixteen sections of Title 37 of the Code of Federal Regulations relating to patent examining and appeal procedures. Interested persons were invited to comment on the proposal by December 7, 1976. One hundred seventy-five written letters and statements were submitted. A hearing was held in Arlington, Virginia on December 7, 1976 at which 21 persons testified orally. Careful consideration has been given to all comments received, and the proposal is being adopted with certain changes.

The regulations adopted involve all sections that were proposed to be revised, amended or added—namely, §§ 1.11, 1.14, 1.52, 1.56, 1.65, 1.69, 1.97, 1.98, 1.99, 1.109, 1.175, 1.194, 1.196, 1.291, 1.292, and 1.346. Amendments also are being made in two sections which were not included in the published proposal—§§ 1.51 and 1.176. Since amendments to these sections are closely related to the substance of matters which were contained in the published proposal, separate notice and public comment on these amendments are deemed unnecessary.

In addition, amendments are being adopted which were published for comment in two earlier, much less extensive proposals that concerned availability of certain files for public inspection. A notice of a proposed amendment to § 1.14(b) was published on June 4, 1974 (39 FR 19786). A notice of a proposed amendment to § 1.11(a) was published on September 17, 1974 (39 FR 33376). No negative comments were submitted with respect to either of these proposals and both are being adopted without change.

The text of the rules will be reproduced in the Patent and Trademark Office OFFICIAL GAZETTE in about a month with additions indicated by arrows and deletions indicated by brackets to help readers identify the changes. A transcript of the hearing, the letters and written statements received, and a summary and analysis of the comments are available for public inspection in Room 11E10 of Crystal Plaza Building 3, 2021 Jefferson Davis Highway, Arlington, Virginia.

PURPOSE OF RULES

The purpose of the rules that are being adopted is to improve the quality and reliability of issued patents by strengthening patent examining and appeal procedures. It is desirable that patents be as dependable as possible, so as to enhance the incentives provided by the patent system to make inventions, to invest in research and development, to put new or improved products on the market, and to disclose inventions that otherwise would be kept as trade secrets. It is believed that the rules being adopted will help to maintain strong patent incentives.

The rules afford patent owners an opportunity, through the filing of a reissue application, to obtain a ruling from an examiner on the pertinence of additional prior art after a patent has been issued. The rules also broaden the public's opportunity for participation in the patent examining process, consistent with the limitations of statute, the protection of trade secrets, and the need to avoid making it unduly expensive to obtain a patent.

The rules set forth the duty of candor and good faith which applicants have to the Patent and Trademark Office and encourage them to provide information about the prior art in a way that will make it more useful to examiners. A provision for foreign language oaths by individuals who do not understand English is intended to make them more aware of their representations and of their obligations.

Under the rules more Patent and Trademark Office decisions that could have important precedent value will be available to the public, and some additional files will be available for inspection. Proceedings before the Board of Appeals are modified to help avoid the issuance of invalid patents. The rules encourage examiners to see that persons inspecting the file history of issued patents will be able to tell why the case was allowed.

REISSUE APPLICATIONS

Amended § 1.175 permits a patent owner to have new prior art considered by the Office by way of a reissue application without making any changes in the claims or specification. It is adopted with no change from the proposal. The requirement for an oath or declaration alleging that the reissue applicant believes "the original patent to be wholly or partly inoperative or invalid. . . ." is dispensed with in § 1.175(a)(1) unless the applicant believes that to be the case. Section 1.175(a)(4) recognizes that reissues may be filed to have the patentability of the original patent considered in view of prior art or other information relevant to patentability which was not previously considered by the Office.

Thus, a patentee may file a reissue if he believes his patent is valid over prior art not previously considered by the Office but would like to have a reexamination. The procedure may be used at any time during the life of a patent. During litigation, a federal court may, if it chooses, stay proceedings to permit new art to be considered by the Office.

If a reissue application is filed as a result of new prior art with no changes in the claims or specification and the examiner finds the claims patentable over the new art, the application will be rejected as lacking statutory basis for a reissue, since 35 USC 251 does not authorize reissue of a patent unless it is deemed wholly or partly inoperative or invalid. However, the record of prosecution of the reissue will indicate that the prior art has been considered by the examiner.

A substantial majority of the comments received favored amended § 1.175 as a means for improving the reliability of patents and avoiding unnecessary litigation costs. The negative comments generally questioned the statutory authority of the Commissioner to adopt this section. Authority for § 1.175 is believed to exist in 35 U.S.C. 6, which is the Commissioner's rulemaking authority, and in 35 U.S.C. 251. The latter section of the statute requires that the patent be deemed wholly or partly inoperative or invalid before a reissue may be granted, but does not require such a belief by the patentee before a reissue application may be filed. The case law does not suggest that the approach of new § 1.175(a)(4) is inconsistent with 35 U.S.C. 251.[1] Inasmuch as 35 U.S.C. 251 is a remedial provision,[2] it is believed that a liberal interpretation is justified and that adequate authority exists for the amended section.

Amended § 1.11(b) opens all reissue applications to inspection by the general public. Section 1.11(b) also provides for announcement of the filings of reissue applications in the OFFICIAL GAZETTE. This announcement will give interested members of the public an opportunity to submit to the examiner information pertinent to patentability of the reissue application. The announcement will include at least the filing date, reissue application and original patent numbers, title, class and subclass, name of the inventor, name of the owner of record, name of the attorney or agent of record, and examining group to which the reissue application is assigned. Section 1.11(b) is amended from the proposal to so indicate. Reissue applications already on file on the effective date of

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[1] See *In re Clark*, 522 F.2d 623, 187 USPQ 209 (CCPA 1975), at footnote 4 where the court declined to decide whether it is proper to seek reissue merely to disclose uncited prior art. See also *In re Altenpohl*, 500 F.2d 1151, 183 USPQ 38 (CCPA 1974).

[2] See *In re Oda*, 443 F. 2d 1200, 170 USPQ 268 (CCPA 1971).

the section will not be automatically open to inspection and will not be announced in the OFFICIAL GAZETTE. However, a liberal policy will be followed in granting petitions for access to individual applications already on file.

In order that members of the public may have time to review the reissue application and submit pertinent information to the Office before the examiner's action, § 1.176 is amended to provide that reissue applications will not be acted on sooner than two months after the OFFICIAL GAZETTE announcement of filing.

A substantial majority of the comments received favored adoption of § 1.11(b). The only opposition was based upon a suggestion that no statutory authority exists. However, since reissue applications contain no new disclosure, and therefore no trade secrets or confidential information, they are considered to present a "special circumstance" within the meaning of 35 U.S.C. 122.

The insertion of "all" as the fifth word of the first sentence of § 1.11(b) is for clarity. The word "furnished" is changed to "obtained" in § 1.11 for clarity.

PROTESTS AND PUBLIC USE PROCEEDINGS

Amended §§ 1.291 and 1.292 give greater recognition to the value of written protests and public use petitions in avoiding the issuance of invalid patents.

A substantial majority of the comments favored these sections and viewed them as improving the quality of issued patents. Entry of protests has been upheld in court.[3]

Section 1.291(a) provides that public protests against pending applications will be entered in the application file and will, if they meet stated requirements, be considered by the examiner. To guarantee consideration by the examiner, protests must be accompanied by copies of prior art documents relied upon, although protests without copies will not necessarily be ignored. This is similar to the requirement of new § 1.98 that copies of patents and publications accompany prior art statements. Section 1.291 does not contemplate permitting a protester to participate as a party in further proceedings. In the case of applications available to the public, such as reissue applications, the protester may file papers rebutting statements made by the applicant. The examiner at his discretion may request a protester to sumit additional written information or may provide extra time for comments by a protester to be filed.

To ensure consideration by the examiner, all protests must be timely submitted. Protests will generally be considered timely submitted, if they are filed before final rejection or allowance of the application by the examiner. The consideration given to protests filed after final rejection or allowance of the application by the examiner will depend upon the relevance of the prior art documents submitted and the point in time at which they are submitted. Obviously, if the prior art documents anticipate or clearly render obvious one or more claims they will not knowingly be ignored. It must be recognized, however, that the likelihood of consideration by the examiner decreases as the patent date approaches. Accordingly, protests must be filed early in order to ensure their consideration.

The first sentence of § 1.291(a) is deleted as unnecessary. Section 1.291(a) also is changed from the proposal to make clear that it applies to pending applications and that all protests will be referred to the examiner having charge of the subject matter involved.

Section 1.291(b) incorporates the existing Office policy of permitting persons to submit prior art citations or copies of prior art after a patent has been granted. The section is changed from the proposal by the addition of the words "any papers related thereto" to recognize that statements as to the pertinence of prior art may be submitted. Both the citations and the related papers are to be entered without comments. The material submitted is not examined by the Office but is available to members of the public inspecting Office records.

Some suggestions were received for major modifications of § 1.291. It was suggested that an advisory opinion of the examiner be placed in the patent file when protests were received after issuance of the patent. Several persons supported a suggestion for examiners to state whether a "new issue" was raised by prior art cited by a protester. Another suggestion was that a procedure similar to that used in the recent Trial Voluntary Protest Programs[4] be adopted on a continuing basis. These suggestions were carefully considered, but are not adopted. The suggestions extend substantially beyond § 1.291 as proposed, and their benefits do not appear sufficient to justify the added cost at this time.

Materials submitted to the Office under §§ 1.291 and 1.292 are to be served upon the applicant, patentee, attorney or agent when possible. The term "patentee" is used in its ordinary sense as defined in 35 USC 100(d). If service is not possible, materials are to be submitted in duplicate so that the Office can attempt to send the duplicate copy. The proposal is changed by adding the words "with the Office" after "filed" in §§ 1.291(c) and 1.292(b) for clarity.

In § 1.292, the requirement that petitioner bear the Office's expenses in conducting the public use proceeding is deleted. Section 1.292 is also amended to ensure that the existence of public use proceedings is recorded in the application file wrapper. Notice of a petition for a public use proceeding will be entered in the file in lieu of the petition itself when the petition and the accompanying papers are too bulky to accompany the file. Any public use papers not physically entered in the file will be publicly available whenever the application file wrapper is available.

DUTY OF DISCLOSURE

Amended § 1.56 defines the duty to disclose information to the Office and the criteria for striking an application when that duty is violated. The wording of the section is changed in several respects from the proposal, but the purpose and general scope are the same as in the proposal. The section codifies the existing Office policy on fraud and inequitable conduct, which is believed consistent with the prevailing case law in the federal courts. The expanded wording of the section is intended to be helpful to individuals who are not expert in the judicially developed doctrines concerning fraud. The section should have a stabilizing effect on future decisions in the Office and may afford guidance to courts as well.

A majority of comments received favored § 1.56 as proposed or with modifications. Persons opposed expressed concern over the imprecise definition of the duty of disclosure and the possibility that the proposal would substantially increase the burden on patent applicants. Some stated that there would be increased litigation as a result of the proposal. Several suggestions were received on better ways to define the individuals who should disclose information and the kinds of information that should be disclosed.

The first sentence of § 1.56(a) is changed from the proposal by adding the word "substantively," so that individuals having a duty of disclosure are limited to those who are "substantively involved in the preparation or prosecution of the application." This change is intended to make clear that the duty does not extend to typists, clerks, and similar personnel who assist with an application. This phrase, when taken with the last sentence of § 1.56(a), is believed to provide an adequate indication of the individuals who are covered by the duty of disclosure. The word "with" is inserted in the first sentence of § 1.56(a) before "the assignee" and before "anyone to whom there is an obligation to assign" to make clearer that the duty applies only to individuals, not to organizations.

Numerous comments concerned the term "relevance" that was used in the proposal. In response to the comments, language is substituted in § 1.56 and related sections which is believed to establish a clearer standard for determining whether information need be disclosed to the Office. "Relevant" is replaced by "material" because the latter term connotes something more than a trivial relationship. It appears to be more commonly used in court opinions. In addition, the third seutence of § 1.56, which defines materiality, is rewritten. The sentence now states that information is material "where there is a substantial likelihood that a reasonable examiner would consider it important in deciding whether to allow the application to issue as a patent." The sentence paraphrases the definition of materiality used by the Supreme Court in its recent decision in *TSC Industries* v. *Northway*.[5] Although in that case the court was concerned with rules promulgated by the Securities and Exchange Commission, the Court's articulation of materiality is believed

[3] *International Paper Co.* v. *Fibreboard Corp.*, 63 F.R.D. 88, 181 USPQ 740 (D. Del. 1974).

[4] 923 O.G. 2; 930 O.G. 1454; 938 O.G. 945.

[5] 426 U.S. ——, 48 L. Ed. 2d 757, 96 S. Ct. 2126, 44 U.S.L.W. 4852, decided June 14, 1976.

consistent with the prevailing concept that has been applied by lower courts in recent patent cases.

The definition of materiality in § 1.56 will have to be interpreted in the context of patent law rather than securities law. Principles followed by courts in securities cases should not be translated to patent cases automatically. It is noteworthy, however, that in formulating the definition of materiality in *TSC Industries* the Supreme Court considered some of the same matters over which concern was expressed in the public comments on proposed § 1.56. The Court noted that the standard of materiality should not be so low that persons would be "subjected to liability for insignificant omissions or misstatements," or so low that the fear of liability would cause management "simply to bury the shareholder in an avalanche of trivial information—a result that is hardly conducive to informed decision making." [6]

Although the third sentence of § 1.56(a) refers to decisions of an examiner, it is intended that the duty of disclosure would apply in the same manner in the less common instances where the official making a decision on a patent application is someone other than an examiner—e.g., a member of the Board of Patent Interferences or the Board of Appeals. This is implicit in the duty "of candor and good faith" toward the Office that is specified in the first sentence of § 1.56(a).

Comments and questions were received concerning the term "information" used in the second and third sentences of § 1.56(a) and elsewhere. It means all of the kinds of information required to be disclosed under current case law. In addition to prior art patents and publications, it includes information on prior public uses, sales, and the like. It is not believed practicable to define information in the text of the rule at this time. However, the rule is not intended to require disclosure of information favorable to patentability—e.g., evidence of commercial success of the invention. Neither is it meant to require disclosure of information concerning the level of skill in the art for purposes of determining obviousness.

Several comments were received concerning the duty to disclose information the patent applicant regards as confidential, including information the applicant has received from another party under an injunction of secrecy. This problem has existed prior to amendment of § 1.56. The Patent and Trademark Office, of course, keeps information disclosed by applicants confidential until a patent is issued. It has been suggested that the Office should develop a mechanism for continuing to hold information in confidence after issuance of a patent if in the judgment of the examiner the information is not material to the examination of the application. The feasibility of offering a rule for public comment on this topic at a later date will be considered.

New § 1.56(b) is added to make clear that information may be disclosed to the Office through an attorney or agent of record or through a pro se inventor, and that other individuals may satisfy their duty of disclosure to the Office by disclosing information to such an attorney, agent or inventor. Information that is not material need not be passed along to the Office.

Proposed sections 1.56 (b) and (c) have been revised and shortened and appear at §§ 1.56 (c) and (d). The proposal was criticized for leaving it open to the Office to apply a different standard of materiality from the one set forth in § 1.56.[7] Section 1.56(d) as adopted states that an application "shall" be stricken when the criteria set forth are met. Thus § 1.56(d) as adopted establishes a single standard for striking applications.

The term "inequitable conduct" is dropped from § 1.56(d) as covering too great a spectrum of conduct to be subject to mandatory striking. Inequitable conduct that is equivalent to fraud is intended to come within the definition of fraud. The Court of Customs and Patent Appeals already has interpreted "fraud" in existing § 1.56 to encompass conduct of this sort.[8] Moreover, § 1.56(d) as adopted calls for striking an application either for fraud or for a violation of the duty of disclosure.

In § 1.56(d) "bad faith" is substituted for the term "deliberate" that was used in the proposal. This change is to make clear than an intent to deceive (or gross negligence equivalent to such an intent) must be shown before an application will be stricken. Bad faith is not present if information is withheld as a result of an error in judgment or inadvertence.

Several comments concerned whether attorneys and agents could represent their clients' interests and at the same time comply with § 1.56. Similar comments were directed to §§ 1.97 to 1.99. It is of course in the interest of the client to have a valid patent and this cannot be obtained without disclosure of known material facts. It is not inconsistent for an attorney or agent to fulfill his duty of candor and good faith to the Office and to act as an advocate for his client. The submission of information under § 1.56 does not preclude the submission of arguments that such information does not render the subject matter of the application unpatentable.

In § 1.65 a new third sentence is added to require the patent applicant to acknowledge the duty of disclosure. The language is changed from the proposal to be consistent with changes made in § 1.56. To allow time for the Office and applicants to revise printed oath and declaration forms now in use, the mandatory acknowledgement of the duty of disclosure in amended § 1.65 does not become effective until January 1, 1978. Applicants at their option may include the new language in oaths and declarations filed prior to the effective date. The Office will publish a separate notice in the Federal Register adding a sentence acknowledging the duty of disclosure to appropriate forms in 37 CFR Part 3, "Forms for Patent Cases."

The word "statement" is deleted from the title of § 1.65 to avoid confusion with the prior art statement of §§ 1.97 through 1.99.

Amended § 1.346 emphasizes that there must be a reasonable basis to support every allegation of improper conduct made by a registered practitioner in any Office proceeding. The language that was proposed is clarified in the section as adopted. Although § 1.346 is limited to papers filed in Office proceedings, the amendment to § 1.346 is not intended to imply that disciplinary action never will be taken against a registered practitioner under § 1.348 for a groundless allegation of improper conduct in a court proceeding.

PRIOR ART STATEMENT

New §§ 1.97, 1.98 and 1.99 deal with prior art statements and provide a mechanism by which patent applicants may comply with the duty of disclosure provided in § 1.56. The sections have been substantially changed from the proposal, in response to comments received.

Unlike the corresponding part of the proposal, the sections as adopted are not mandatory, though applicants are strongly encouraged to follow the procedures described in them. Applications will be examined whether or not a prior art statement is filed and whether it complies with the rules or is defective. It is nevertheless believed that applicants will find that the use of prior art statements complying fully with the requirements of §§ 1.97 through 1.99 will be the best way to satisfy the duty of disclosure. The Patent and Trademark Office cannot assure that prior art disclosed in other ways will be considered by the examiner.

Sections 1.97 through 1.99 do not prescribe the content of what materials should be submitted in the prior art statement; this is for the applicant and the attorney or agent to decide in the light of the duty of disclosure expressed in § 1.56. The only criterion contained in §§ 1.97 through 1.99 as to content of the art cited is in § 1.97(b). This subsection indicates that the statement will be construed as a representation that the prior art listed includes what the submitter considers to be the closest art of which he is aware. The submitter need not decide which particular items of prior art are the closest or identify any items as such; the representation is simply that he is not withholding known prior art which he considers closer than that which is submitted. Section 1.97(b) makes clear that the prior art statement is not a representation that a search has been made or that no better art exists.

In § 1.97(a) the time for filing the prior art statement is extended from the two months of the original proposal to three months. In most cases prior art submitted within three months will be available to the examiner before he takes up the case for action, though it will be helpful if citations are made as promptly as possible.

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[6] 426 U.S. at——, 48 L. Ed. 2d at 765, 96 S. Ct. at 2132, 44 U.S.L.W. at 4855.

[7] See discussion accompanying proposed rules in Federal Register of October 4, 1976, page 43731, first sentence.

[8] *Norton* v. *Curtiss*, 433 F. 2d 779, 792, 167 USPQ 532, 543 (CCPA 1970).

Section 1.98 lists the elements of the prior art statement: a listing of the art, a concise explanation of the relevance of each listed item, and copies of the art or the pertinent portions thereof.

The prior art statement resembles somewhat the "patentability statement" of the proposal and the "patentability brief" proposed elsewhere.[9] The name has been changed to reflect a change in the requirements of § 1.98(a). Unlike the proposed version of this paragraph, which called for an explanation of why the claimed invention is believed patentable over the cited art, the paragraph as adopted calls only for a concise explanation of the relevance of each listed item. This may be nothing more than identification of the particular figure or paragraph of the patent or publication which has some relation to the claimed invention. It might be a simple statement pointing to similarities between the item of prior art and the claimed invention. It is permissible but not necessary to discuss differences between the prior art and the claims. It is thought that the explanation of relevance will be essentially as useful to the examiner as the formerly proposed explanation of patentability, and should be significantly less burdensome for the applicant to prepare.

Section 1.98 requires a copy of each patent or publication cited, including U.S. patents, to accompany the prior art statement. Several comments questioned the need for burdening the applicant to supply copies of materials that are present in the Office's files. However, substantial time and effort often is needed to locate a document in the Office's files. Since the person submitting the prior art statement generally has available a copy of the item being cited, it is believed that expense and effort can be minimized by having that person supply the copy in all cases. Consideration has been given to proposals to allow the applicant to submit an order for copies of the patents along with his statement instead of actually submitting copies. This will be further studied, but to date no way has been found to assure that the copies will be available to the examiner by the first action unless the applicant submits them with the prior art statement.

Other changes to §§ 1.97 through 1.99 from the proposal eliminate unnecessary language and clarify the requirements.

A notice published in 1974 [10] contained guidelines for the citation of prior art by applicants. Many of those guidelines are repeated or superseded by §§ 1.97 through 1.99. In order to allow applicants, attorneys and agents time to adjust their procedures to comply with the requirements for prior art statements, the effective date of §§ 1.97 through 1.99 will be July 1, 1977. Until these new sections become effective, applicants should continue to follow the 1974 guidelines. Issuance of a revised notice, to take effect July 1, 1977, is under study.

A survey conducted by the Office in 1976 concludes that many applicants have not been citing prior art to the Office.[11] It is hoped that with the duty of disclosure expressly set forth in § 1.56, applicants will perceive that it is to their advantage to use the procedures of §§ 1.97 through 1.99.

Section 1.51 is amended by designating the existing rule as § 1.51(a) and adding new § 1.51(b) which contains a reference to §§ 1.97 through 1.99.

FOREIGN LANGUAGE OATHS

Amended § 1.52 and new § 1.69 are adopted as proposed.

Section 1.69 requires that oaths and declarations be in a language which is understood by the individual making the oath or declaration, i.e., a language which the individual comprehends. If the individual comprehends the English language, he must use it. If the individual cannot comprehend the English language, any oath or declaration must be in a language which the individual can comprehend. If an individual uses a language other than English for an oath or declaration, the oath or declaration must include a statement that the individual understands the content of any documents to which the oath or declaration relates. If the documents are in a language the individual cannot comprehend, the documents may be explained to him so that he is able to understand them.

The Office will provide approved translations for as many of the oath or declaration forms which appear in Part 3 of Title 37 of the Code of Federal Regulations as practicable, and in as many languages as practicable, probably using a side-by-side English/foreign language format. The availability of the foreign language forms will be announced in the OFFICIAL GAZETTE at a later date.

The change in § 1.52, providing for an exception to the requirement that oaths and declarations be in the English language, is necessitated by the adoption of § 1.69.

Although very few persons opposed §§ 1.52 and 1.69, several suggested that the philosophy behind the change be extended to the specification, requiring the specification to be in a language which the applicant understands, accompanied by an English translation. This suggestion was not considered feasible because of the obvious burdens on the applicant and the danger to the applicant and the public if the translation is not literally correct. Also, if a large number of applications were filed in a foreign language, there would be significant administrative burdens on the Office. Attention is directed to the Manual of Patent Examining Procedure, § 608.1, which permits non-English language applications to be filed in certain limited circumstances.

Other suggested modifications of the proposed rule included: (1) using an English language oath or declaration with one additional clause in a language understood by the person making the oath or declaration, the clause stating that the person understands all the documents to which the oath or declaration relates; and (2) extending the two month grace period for filing an English translation of an oath or declaration filed under § 1.65.

After due consideration, suggestion (1) was believed not to accomplish the objectives of the rule as well as the adopted rule. Suggestion (2) would cause unsatisfactory delays in the initial processing of applications.

DECISIONS AND FILES MADE PUBLIC

Section 1.14(d) makes more explicit the conditions under which significant decisions of the Patent and Trademark Office will be made available to the public, and includes reference to decisions of the Board of Patent Interferences, in addition to decisions of the Board of Appeals and the Commissioner.

A large majority of the comments received were favorable. Several commentators felt that more decisions would be made available as a result of the proposed section and that it would assist in publicizing aspects of Office procedure which may not have been available previously.

Some negative comments were based on the view that the Freedom of Information Act [12] required all decisions of the Office to be made publicly available. A greater number of those oposing the proposed section, however, felt that applicants should have an absolute right to have their applications maintained in confidence and that no information should be made public without specific authorization from them. One commentator felt that rulemaking on this subject should be deferred until currently pending litigation [13] under the Freedom of Information Act was finally resolved.

The section as adopted is applicable to decisions deemed by the Commissioner to involve an interpretation of patent laws or regulations that would be of significant precedent value, where such decisions are contained in either pending or abandoned applications or in interference files not otherwise open to the public. It is applicable whether or not the decision is a final decision of the Patent and Trademark Office.

The parenthetical phrase in the first sentence of the proposed section, which cited other provisions of the rules under which decisions are open to public inspection, is deleted as unnecessary and possibly confusing. Also, in view of several comments received, the period of time during which an applicant or party in interest may object to having a decision made public is extended from one month to two months. At least twenty days is given to request reconsideration and seek court review before a decision is made public over an objection.

Section 1.14(d) is considered to place a duty on the Patent and Trademark Office to identify significant decisions and to take the steps necessary to inform the public of such decisions, by publication of such decisions, in whole or in

[9] E.g., Federal Register of September 9, 1968, 34 FR 14176, 866 O.G. 1402; S. 2255, 94th Congress, § 131(b).

[10] Notice of August 12, 1974, 926 O.G. 2.

[11] BNA's Patent, Trademark and Copyright Journal, No. 301, October 28, 1976, page D–1.

[12] 5 USC 552.

[13] *Irons* v. *Gottschalk*, Slip Opinion, No. 74–1365 (D.C. Cir., October 21, 1976).

part. It is anticipated, however, that no more than a few dozen decisions per year will be deemed of sufficient importance to warrant publication under the authority of this section.

Amended § 1.14(b) allows public inspection of abandoned applications referred to in defensive publications. The comments received on the proposed amendment on this topic in 1974 expressed no opposition and the proposal is adopted without change.

The amendment is intended to encourage use of the defensive publication program provided under § 1.139. The objective of that program is to make available to the public the technical disclosure of applications in which the owner prefers to publish an abstract in lieu of obtaining an examination. Existing §§ 1.11(b) and 1.139 open the complete defensive publication application to inspection by the general public upon publication of the abstract. With the amendment, an abandoned application referred to in a defensive publication application will likewise be open to public inspection, avoiding any need to repeat its contents in the defensive publication application. Thus, public availability of the applications involved should be of benefit both to the applicant and the public.

A suggestion was made that the section be extended still further to include abandoned applications referred to in foreign patents. This suggestion, however, goes too far beyond the proposal that was published and has too uncertain an impact to be adopted at this time.

Amended § 1.11(a) provides earlier access to the file of an interference which involved a patent or an application on which a patent has issued. All comments that were submitted on the 1974 proposal on this topic were favorable and two commentators felt the proposal should be extended further. The proposal is being adopted without change.

Under present practice, access to the file of an interference is not permitted until judicial review of the decision of the Board of Patent Interferences has been exhausted. The amended section allows access to the file after final decision of the Board of Patent Interferences if that decision is an award of priority as to all parties. It is believed that such earlier access will be of benefit to members of the public by making available information relevant to the issuance of the patent whether or not the interference decision is still being adjudicated.

PATENT APPEALS

Section 1.194 clarifies the circumstances in which oral hearings should be requested, provides for oral arguments by or on behalf of examiners in certain appeals and reduces the time permitted for oral arguments.

Comments relating to this section were favorable by a very substantial majority, although there were several reservations to the effect that § 1.194(a) tended to discourage or downgrade oral arguments. Participation by examiners was considered to be desirable not only from the standpoint of improving the overall presentation of the argument, particularly in complex cases, but also for the educational and experience benefits to the examiners themselves.

The only opposition to the section was based on the feeling that oral hearings would be discouraged. The rule is intended to discourage oral hearings only to the same extent as the Office's 1975 Official Gazette notice on the subject.[14] Section 1.194(a) indicates that oral hearings should not be requested as a matter of course in every appeal, but only in those circumstances where the appellant feels that such a hearing will be of material assistance to the proper presentation of the appeal. The section expressly provides that equal consideration will be accorded in deciding all appeals, whether or not an oral hearng is held.

In appeals where the appellant has requested an oral hearing, § 1.194(b) provides for oral argument by, or on behalf of, the primary examiner, if such argument is considered to be helpful by either the primary examiner or the Board. This provision incorporates the present practice of permitting examiners to present an oral argument before the Board.[15] It gives the Board additional discretionary authority to request presentation of an oral argument by, or on behalf of the examiner to ensure that all issues are fully and accurately presented.

Section 1.194(c) provides, as does existing § 1.194, that appeals will be assigned for consideration and decision without an oral hearing where none has been requested by the appellant. Where an oral hearing has been requested, a day of hearing will be set, and both appellant and the primary examiner will be notified. A provision for notice to the examiner is added to the proposed version. Additionally, § 1.194(c), reflects the present practice of limiting oral argument on behalf of the appellant to twenty minutes.[16] The time permitted for argument by the examiner has been shortened from twenty minutes, as proposed, to fifteen minutes. The examiner, unlike the appellant, will not ordinarily need time to present the facts of the case or for rebuttal.

In any appeal where oral argument is to be presented by, or on behalf of, the primary examiner, the appellant will be given due notice of that fact.

Proposed § 1.196(b) would have authorized the Board of Appeals to reject allowed claims, in cases before it, whenever the Board had knowledge of grounds for so doing.

While a majority of those commenting on this section favored in principle the concept of allowing the Board to have this right, significant concern was voiced that there was no statutory authority for the Board to actually reject allowed claims. Further, the question of proper authority for judicial review of such action by the Board was a matter of concern. Other reasons advanced in opposition to the section were that applicants would be inhibited from appealing by the risk of having allowed claims rejected and that the proposal would create a higher presumption of validity in cases reviewed by the Board. A significant number commented that it would be more appropriate for the Board to remand the case to the primary examiner for consideration of the grounds raised by the Board. This would afford the applicant an opportunity to demonstrate the patentability of the claims and would remove any question as to statutory authority.

In view of the comments received, existing § 1.196(b) will not be modified, but a new § 1.196(d) is added providing express authority for the Board of Appeals to include, in its decision, a statement of any grounds for rejecting any allowed claim that it believes should be considered by the primary examiner. Section 1.196(d) provides that the Board may remand the case to the examiner for such consideration, and that the applicant shall have an opportunity to respond to the grounds set forth by the Board prior to consideration, by the examiner. If the previously allowed claims are rejected by the examiner, the rejection may be appealed to the Board.

The new section further provides that a decision of the Board which includes a remand will not be considered as a final decision in the case, but that the Board, following conclusion of the proceedings before the primary examiner, will either adopt its earlier decision as final or will render a new decision based on all appealed claims, as it considers appropriate. In either case, final action by the Board will give rise to the existing alternatives available to an appellant following a decision by the Board.

In situations where the primary examiner concludes after consideration of all the evidence and argument that the remanded claims should be allowed, the new rule dealing with reasons for allowance (§ 1.109) provides an appropriate mechanism for him to explain, on the record, his reasoning for coming to this conclusion, notwithstanding the grounds set forth by the Board in its statement.

Promulgation of new § 1.196(d) does not affect the Board's existing authority to remand a case to the primary examiner without rendering a decision in appropriate circumstances. Section 1.196(d) is not intended as an instruction to the Board to reexamine every allowed claim in every appealed application. It is, rather, intended to give the Board express authority to act when it becomes apparent, during the consideration of rejected claims, that one or more allowed claims may be subject to rejection on either the same or on different grounds from those applied against the rejected claims.

REASONS FOR ALLOWANCE

New § 1.109 is intended to emphasize and formalize the examiner's authority to state his reasoning for allowing a claim or claims. The authority is discretionary with the examiner and is only to be used when the record does not otherwise reveal the reasons for allowance.

[14] See notice of March 20, 1975, 933 O.G. 1010.
[15] MPEP, § 1209.

[16] See notice of March 20, 1975, 933 O.G. 1010.

A majority of the comments received favored the rule as proposed because it would tend to provide courts and others who were reviewing the patent with a clearer record. Those who opposed the rule most often gave the reason that the examiner might fail to state all the reasons or the strongest reasons why a claim was allowed, which could place unnecessary limitations on the claims or create an estoppel in subsequent litigation or licensing.

To help insure that the examiner's statement of his reasoning in allowing a claim will not unnecessarily limit the claims or create an estoppel, a final sentence is added to the proposal which states that failure of the applicant to comment upon or rebut the examiner's reasoning "shall not give rise to any implication that the applicant agrees with or acquiesces in the reasoning of the examiner."

Several commenters suggested that stricter enforcement of §§ 1.111 and 1.133 would eliminate the need for a new rule concerning reasons for allowance. Situations exist, however, where a statement of reasons for allowance could be helpful, for example when an examiner withdraws a rejection for reasons not suggested by the applicant; when an applicant submits several arguments for allowing a claim and the examiner finds not all of them persuasive; when an examiner allows a claim on the first Office action after citing very close prior art; and when the examiner allows a claim after remand from the Board of Appeals (see new § 1.196(d)).

The first sentence of the proposed rule is changed to define more precisely the circumstances in which an examiner's statement is appropriate, as well as to define more precisely the content of the statement. The statement will include the examiner's "reasoning." The examiner may state his reasoning whenever he "believes that the record of the prosecution as a whole does not make clear his reasons for allowing a claim or claims."

Several persons commented that the rule should provide a procedure for appeal from the examiner's statement of his reasoning. The rule does permit applicants to comment upon the examiner's reasoning. If the applicant does not wish to comment, he may reserve for a later proceeding, without prejudice, any rebuttal.

[Text of adopted rules appears in 37 CFR, revised 7–1–77]

Effective Date. These amendments become effective on March 1, 1977, except for §§ 1.51, 1.97, 1.98, and 1.99 which become effective on July 1, 1977, and §§ 1.65 and 1.69 which become effective on January 1, 1978.

Date: Jan. 18, 1977.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Approved:

BETSY ANCKER-JOHNSON, PH.D.
Assistant Secretary for Science and Technology.

Date: Jan. 19, 1977.

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(66) GUIDELINES FOR IMPLEMENTATION OF RECENTLY REVISED RULES

Recently a number of rules relating to Patent Examining and Appeal Procedures were revised. The new rules were published in the Federal Register at 42 F.R. 5588 on January 28, 1977, and in the OFFICIAL GAZETTE at 955 O.G. 1054 on February 22, 1977. The following guidelines are being published to describe the procedures which are being followed in implementing 37 CFR sections 1.11, 1.97–1.99, 1.109, 1.194, 1.291 and 1.292.

Files Open to the Public

Section 1.11(b) is applicable only to those reissue applications filed on or after March 1, 1977. Those reissue applications already on file will not be automatically open to inspection but a liberal policy will be followed by the Office of the Solicitor in granting petitions for access to such applications.

(NOTE.—These sections as changed will be incorporated into the Manual text in Rev. 3 of the Manual.)

For those reissue applications filed on or after March 1, 1977, the following procedure will be observed:

1) The filing of reissue applications will be announced in the OFFICIAL GAZETTE and will include certain identifying data as specified in section 1.11(b). Any member of the general public may request access to a particular reissue application filed after March 1, 1977. Since no record of such request is intended to be kept, an oral request will suffice.
2) The reissue application files will be maintained in the examining groups and inspection thereof will be supervised by group personnel. Although no general limit is placed on the amount of time spent reviewing the files, the Office may impose limitation, if necessary, e.g., where the application is actively being processed.
3) Where the reissue application has left the examining group for administrative processing, requests for access should be directed to the appropriate supervisory personnel in the Division or Branch where the application is currently located.
4) Requests for copies of papers in the reissue application file must be in writing addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231 and may be either mailed or delivered to the Office mailroom. The price for copies made by the Office is thirty cents per page.

Prior Art Statements

This notice supersedes the notices of August 12, 1974 (926 O.G. 2) and May 19, 1975 (935 O.G. 902) relating to citations of prior art. Although new sections 1.97 through 1.99 are not effective until July 1, 1977, and are not mandatory upon applicants, they provide an ideal mechanism for complying with the duty of disclosure under 37 CFR 1.56. The statements should be submitted in accordance with the following guidelines:

1) Prior art statements should be submitted at the time of filing the application or within three months thereafter and may be separate from the specification or incorporated therein. The statement shall serve as a representation that the person preparing it has included therein what he believes to be the closet prior art of which he is aware and shall not be construed as a representation that no better art exists or that a search has been made. If the first action in the application is received prior to three months after filing of the application and no prior art statement has been submitted, the prior art statement may be submitted with the response to the first action and be considered timely.
2) The statement shall include a listing of the patents, publications or other information which the preparer of the statement wishes to cite and a concise explanation of the relevance of each listed item. Copies of the pertinent portions of all listed documents shall be supplied along with the statement, both when incorporated into the specification and when filed separately. If two or more patents or publications considered material are substantially identical, a copy of a representative one shall be included with the statement and others may merely be listed with an indication of which are considered to be substantially identical.
3) A translation of the pertinent portions of foreign language patents or publications considered material should be transmitted if an existing translation is readily available to the applicant. It will be sufficient, however, to transmit an equivalent English language patent or publication so long as it is identified as an equivalent.

   Where the applicant has submitted copies of prior art in accordance with these guidelines in a prior application, reference to the prior application and the submission therein will be sufficient for the continuing application as far as the copies are concerned. As far as the statement per se is concerned, the relevance of the prior art to the claimed subject matter must be indicated if it differs from its relevance as explained in the prior application.
4) If prior to the issuance of a patent an applicant pursuant to his duty of disclosure under 37 CFR 1.56, wishes to bring to the attention of the Office additional patents, publications or other information not previously submitted, the additional information should be submitted to the Office with rea-

sonable promptness. It may be included in a supplemental prior art statement or may be incorporated into other communications to be considered by the examiner. Any transmittal of additional information shall be accompanied by explanations of relevance and by copies in accordance with the requirements aforementioned. The transmittal should include a statement explaining why the prior art was not earlier submitted.

While the Patent and Trademark Office will not knowingly ignore any prior art which might anticipate or suggest the claimed invention, no assurance can be given that cited art or other information not submitted in accordance with these guidelines will be considered by the examiner.

After the claims have been indicated as allowable by the examiner, e.g., by the mailing of an Ex parte Quayle action, a notice of allowability (PTOL–327), an examiner's amendment (PTOL–37), or a Notice of Allowance (PTOL–85), any citations submitted will be placed in the file. Since prosecution has ended, however, such submissions will not ordinarily be considered by the examiner unless the citation is accompanied by:

(*a*) A proposed amendment cancelling or further restricting at least one independent claim and narrowing the scope of protection sought;
(*b*) A timely affidavit under 37 CFR 1.131 with respect to the material cited; or
(*c*) A statement by the applicant or his attorney or agent that, in the judgment of the person making the statement, the prior art or other information cited raises a serious question as to the patentability of the claimed subject matter, or is closer prior art than that of record.

If the material is submitted after the base issue fee has been paid, it must also be accompanied by a petition under 37 CFR 1.183 requesting a waiver of 37 CFR 1.312. Such petition, if granted, would result in review of the art by the examiner and possible entry of the amendment.

In each instance where an examiner considers, but does not cite on form PTO–892, specific prior art referred to in a paper placed in the application file, the examiner will place a notation adjacent to the reference according to the following:

If included in the specification, the examiner will write his or her initials adjacent to any references checked and enter "checked" in the left margin opposite the initials. If presented in a separate paper or in the remarks of an amendment, the examiner's initials and "checked" will be entered adjacent to the citations or wherever possible to indicate clearly those checked.

Reasons for Allowance

One of the primary purposes of the change in Section 1.109 is to improve the quality and reliability of issued patents by providing a complete file history which should clearly reflect, as much as is reasonably possible, the reasons why the application was allowed. Such information facilitates evaluation of the scope and strength of a patent by the patentee and the public and may help avoid or simplify litigation of a patent.

The practice of stating the reasons for allowance is not new and the rule merely formalizes the examiner's existing authority to do so and provides applicants an opportunity to comment upon any such statement of the examiner.

When the examiner determines that it is necessary or desirable, a "Statement of Reasons for Allowance" will be prepared. The "Statement" will usually be an attachment to either a notice of allowability (PTOL–327) or Examiner's Amendment (PTOL–37). Any comments considered necessary by applicant must be submitted no later than the issue fee and should preferably *accompany* the issue fee. Submission with the issue fee avoids any delay in the processing of the application and avoids the necessity to associate the comments with the application while it is in issue except at the time the file must be pulled to record the payment of the issue fee. Such comments will be entered in the application file by the Allowed Files Branch with an appropriate notation on the "contents" list of the file wrapper, but will not be reviewed by the examiner.

Oral Hearings Before Board of Appeals

Section 1.194 clarifies the circumstances in which oral hearings should be requested and provides for oral arguments by, or on behalf of, primary examiners in certain appeals.

Under Section 1.194, the following procedures will be in effect:

1) In accordance with Section 1.192, appellants who desire an oral hearing must request the same at the time of filing the appeal brief.
2) If appellant has requested an oral hearing and the primary examiner intends to present an oral argument, the last paragraph of the examiner's answer will indicate this intention.
3) Notice of the oral hearing will be given to the appellant and, at the same time, to the primary examiner in those cases in which the primary examiner has indicated an intention to present an oral argument.
4) After an oral hearing has been confirmed and the date set as provided in Section 1.194(c), the application file will be delivered to the examiner via the appropriate Group Director at least one week prior to the date of the hearing for those cases in which the examiner is expected to be present at the hearing. In those cases where the Board requests the presentation of an oral argument by, or on behalf of, the primary examiner, the appellant will be so notified. The Board's request for an oral argument may, where appropriate, indicate specific points or questions to which the argument should be particularly directed. The application file will be returned to the Board before the hearing.
5) In those appeals in which an oral hearing has been confirmed and either the primary examiner or the Board has indicated a desire for oral argument, such oral argument may be presented whether or not appellant appears.

Protests and Public Use Proceedings

Amended sections 1.291 and 1.292 give greater recognition to the value of written protests and public use petitions and are intended as an aid in avoiding the issuance of invalid patents.

Under sections 1.291 (b) and (c) and 1.292(b), the following procedures will be observed:

1) Only in those instances where it has not been possible to serve protest papers upon the applicant, attorney or agent, should duplicates of the papers submitted be provided. In this case the appropriate examining group will attempt to get the duplicate copy to the applicant, attorney or agent. However, every effort should be made by the protester to effect service.
2) Citations of prior art and any papers related thereto may be entered in the file after a patent has been granted by submitting them to the attention of the Record Room, where they will be entered without comment by the Office. If after diligent effort it has not been possible to serve the prior art citations and related papers on the patentee, his attorney or agent, duplicate copies should be submitted in which case the Record Room will attempt to get the duplicate copy to the owner of record.
3) When public use petitions and accompanying papers are submitted they, or a notice in lieu thereof, will be entered in the application file. Duplicate copies should be submitted only when, after diligent effort, it has not been possible for petitioner to serve a copy of the petition on the applicant, his attorney or agent in which case the Office of the Solicitor will attempt to get the duplicate copy to the applicant, his attorney or agent.
4) To ensure consideration by the examiner, protests should be timely submitted, i.e., before final rejection or allowance. Consideration of protests filed after final rejection or allowance will depend upon the relevance of the prior art documents and the point in time at which they are submitted. Documents which clearly anticipate or render obvious one or more claims will not knowingly be ignored. If protests are not timely submitted or if they fail

to comply with section 1.291(a) as to the submission of a copy of each prior art document relied upon, they will be acknowledged and referred to the examiner having charge of the subject matter involved for entry in the application file and such consideration as seems warranted.

In each instance where an examiner considers but does not cite on form PTO–892 specific prior art referred to in a protest, the examiner will place a notation in the protest paper adjacent to the reference which will include his or her initials and the term "checked."

Additional future guidelines as to protest procedures may be developed after gaining experience with the new practice.

C. MARSHALL DANN,
Mar. 18, 1977. *Commissioner of Patents and Trademarks.*

[957 O.G. 11]

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(67) FURTHER GUIDELINES RELATING TO 37 CFR 1.175 AND 1.291, AS AMENDED EFFECTIVE MARCH 1, 1977

The experience with the above revised rules since their effective date has indicated the desirability of further guidelines relating to the manner in which they are to be implemented. The following guidelines are supplemental to those which have already been provided in the publication of the rules in the Federal Register of January 28, 1977 (42 F.R. 5588) (955 O.G. 1054, February 22, 1977), and in the earlier Guidelines published at 957 O.G. 11 on April 12, 1977. Copies of the latter two OFFICIAL GAZETTE publications appear as items 59 and 60 of the current "Consolidated Listing of Recent Official Gazette Notices" published at 966 O.G. 22–32. The present guidelines are also supplemental to the appropriate sections of the Manual of Patent Examining Procedure, e.g., Sections 1401–1401.12 relating to reissue, and Section 1309.02 relating to protests. Sections 721 and 721.01 of the MPEP contain guidelines to be followed if either a reissue or other application, or a protest relative to any application, raises questions of "fraud" or "violation of the duty of disclosure." Accordingly, the above-noted materials should be consulted in addition to these further guidelines, which are in themselves not intended to completely treat the subjects involved. For the most part, the guidelines herein merely identify and clarify existing requirements and practices. The Patent and Trademark Office has a general study underway of the procedures for handling reissue applications and protests which may result in future modifications in these guidelines.

Section 1.175(a)(4) of the revised rules recognizes that reissues may be filed to have the patentability of the original patent, without changes therein, considered in view of prior art or other information relevant to patentability which was not previously considered by the Office.

The experience to date reveals the need to clarify what should be filed by the applicant in order to seek the reexamination contemplated by sub-section (a)(4) and also the type and content of the examination which the examiner will give to applications filed under sub-section (a)(4).

First, sub-section (a)(4) does *not* contemplate, or permit, the filing of a reissue application without an oath or declaration. To the contrary, an oath or declaration is required, and such oath or declaration *must* comply with each of sub-sections (a)(4), (a)(5), and (a)(6). Thus, under sub-section (a)(4) the oath or declaration must particularly specify the "prior art or other information relevant to patentability, not previously considered by the Office," which the reissue applicant considers "might cause the examiner to deem the original patent wholly or partly inoperative or invalid." The reissue oath or declaration must also request, under sub-section (a)(4), that "if the examiner so deems, the applicant be permitted to amend the patent and be granted a reissue patent."

Under sub-section (a)(5), the reissue oath or declaration, including those filed under sub-section (a)(4), must particularly specify "the errors or what might be deemed to be errors relied upon, and how they arose or occurred."[1] This sub-section has two specific requirements, *both of which must be complied with* in, or by, the reissue oath or declaration. Thus, insofar as (a)(4) reissue oaths or declarations are concerned, the oath or declaration must particularly specify "what might be deemed to be errors." For example, if the reissue applicant is seeking reexamination in view of particular prior art or other information, the reissue oath or declaration must point out "what might be deemed to be errors" in patentability in view of such prior art or other information. More specifically, the oath or declaration, in appropriate circumstances, might state that some or all claims might be deemed to be too broad and invalid in view of references X and Y which were not of record in the patented files. Usually, a general statement will suffice. But where appropriate, such as where the pertinence of the new references X and Y are not evident, more specificity about "what might be deemed to be errors" should be provided. Of course, the reissue applicant does *not* have to, and presumably does *not*, agree that "errors" exist. However, the reissue applicant does have to, in the reissue oath or declaration of the sub-section (a)(4) type, particularly specify "what might be deemed to be errors relied upon."

In addition to specifying "what might be deemed to be errors relied upon," sub-section (a)(5) also requires "particularly specifying" "how they arose or occurred." This means, of course, that the reissue oath or declaration must specify the manner in which that which "might be deemed to be errors" "arose or occurred." For example, if the (a)(4) reissue is being filed for reexamination in view of prior art or other information, the reissue oath or declaration must indicate when and the manner in which the reissue applicant became aware of the possible error in the patent, e.g., third party allegation, discovery of prior art or other information subsequent to issuance of patent, knowledge of prior art or other information before issuance of patent with significance being brought out after issuance by third party, through allegations made in litigation involving the patent, etc. It is particularly important that the reissue oath or declaration adequately specify how "what might be deemed to be errors" arose or occurred. If the reissue oath or declaration does not particularly specify "how," i.e., the manner in which any possible errors arose or occurred, the Office will be unable to adequately evaluate reissue applicant's statement in compliance with (a)(6) that the "errors, if any, arose 'without any deceptive intention' on the part of the applicant."

Sub-section (a)(6) specifically requires that the reissue oath or declaration, including those filed under sub-section (a)(4), contain the averment that the "errors, if any, arose 'without any deceptive intention' on the part of the applicant." This requirement must not be overlooked in filing since the requirement for an absence of "deceptive intention" is a necessary part of any reissue application, including those of the (a)(4) type.

The significance and importance of sub-sections (a)(5) and (a)(6) must not be overlooked or minimized insofar as reissue oaths or declarations are concerned, including those filed under sub-section (a)(4). These sub-sections, to a large extent, enable the Office to make its determination required by statute that any error is "without any deceptive intention."

In addition to meeting the requirements of Sections 1.175 (a)(4)–(a)(6) insofar as the reissue oath or declaration is concerned, the reissue applicant, at the time of filing the reissue application, including the (a)(4) type reissue application, must also be aware of the requirements of 37 CFR 1.56, as revised effective March 1, 1977. Reissue applicants may, of course, utilize new Sections 1.97–1.99 to comply with the duty of disclosure required by Section 1.56. While Section 1.97(a) provides for filing of the prior art statement within three months of the filing of the application, reissue applicants are encouraged to file the prior art statement at the time of filing the application in order that such prior art statements will be available to the public during the two-month period provided by Section 1.176.

In situations in which the patent for which reexamination is being sought is, or has been, involved in litigation, which raised a question material to examination of the reissue application, such as the validity of the patent, or any allegation of fraud, the existence of such litigation must be brought to the attention of the Office at the time of, or shortly after, filing the application, either in the reissue oath or declaration, or in a separate paper, preferably accompanying the application as filed. Litigation begun after filing of the reissue application also should be promptly brought to the attention of the Office. The details and documents from the litigation, insofar as they are "material to the examination" of the reissue application as defined in 37 CFR 1.56(a), should accompany the application as filed, or be submitted as

[1] The text of sub-section (a)(5) is incorrectly reproduced in the July 1977 revision of Title 37 CFR. The text, as quoted herein, is correct.

promptly thereafter as possible. For example, the defenses raised against validity of the patent, or charging fraud or inequitable conduct in the litigation. would normally be "material to the examination" of the reissue application. It would, in most situations, be appropriate to bring such defenses to the attention of the Office by filing in the reissue application a copy of the Court papers raising such defenses. As a minimum, the applicant should call the attention of the Office to the litigation, the existence and nature of any allegations relating to validity and/or "fraud" relating to the original patent, and the nature of litigation materials relating to these issues. Enough information should be submitted to clearly inform the Office of the nature of these issues so that the Office can intelligently evaluate the need for asking for further materials in the litigation. Thus, the existence of supporting materials which may substantiate allegations of invalidity or "fraud" should, at least, be fully described, or submitted. The Office is *not*, of course, interested in receiving voluminous litigation materials which are *not* relevant to the Office's consideration of the reissue application. The status of the litigation should be updated in the reissue application as soon as significant events happen in the litigation.

The Examination of Reissue Applications, Including Those Filed Under 37 CFR 1.175(a)(4)

The examination of reissue applications, including those filed under sub-section (a)(4), will be in accordance with Sections 1401–1401.12, M.P.E.P. Attention is particularly directed to Section 1401.09, M.P.E.P. which refers to the two aspects of reissue examination, i.e., examination in the same manner as an original application and examination for compliance with the reissue statute and rules. The purpose of the present guidelines is to supplement those presently in existence and to emphasize certain points, particularly as they relate to reissue applications filed under sub-section (a)(4).

When examining the reissue application the examiner will consider whether or not applicant, in the reissue oath or declaration, has complied with each of the requirements of 37 CFR 1.175. For example, in all reissue applications, the reissue oath or declaration must comply with the requirements of the first sentence of 37 CFR 1.65. When the reissue application is other than the (a)(4) type, the reissue oath or declaration must comply with the appropriate sub-sections (a)(1) to (a)(3) and sub-sections (a)(5) and (a)(6). When the reissue application is filed under sub-section (a)(4), the reissue oath or declaration must also comply with sub-sections (a)(5) and (a)(6). Thus, all reissue applications must comply with sub-sections (a)(5) and (a)(6). If the examination reveals a lack of compliance with any requirement of Section 1.175, e.g., the requirements of sub-sections (a)(5) and/or (a)(6), a rejection will be made on the basis that the reissue oath or declaration is insufficient. See Section 1401.08, M.P.E.P. Under no circumstances will any reissue application be passed for issue without full compliance with 37 CFR 1.175.

Applications filed under sub-section (a)(4) will not, of course, be passed for issue without amendment, but will be rejected as lacking statutory basis for a reissue if *there are no other grounds for rejection*, since 35 U.S.C. 251 does not authorize reissue of a patent unless the patent is deemed wholly or partly inoperative or invalid. If a reissue filed under sub-section (a)(4) is subsequently amended thereby converting it into an application under sub-sections (a)(1) to (a)(3), *a supplemental reissue oath or declaration must be filed containing the appropriate averments.* If such a proper supplemental oath or declaration is not filed, a rejection will be made on the basis that the reissue oath or declaration is insufficient. The supplemental oath or declaration insures compliance with 35 U.S.C. 251 by providing appropriate averments relating to actual errors rather than possible errors.

If the examiner becomes aware of litigation involving the patent sought to be reissued during examination of the reissue application, and applicant has not made the details regarding that litigation of record in the reissue application, the examiner, in the next Office action, will inquire regarding the same. The following paragraph may be used for such an inquiry:

> "It has come to the attention of the examiner that the patent sought to be reissued by this application (is) (has been) involved in litigation. Any documents and/or materials, including the defenses raised against validity, or against enforceability because of fraud or inequitable conduct, which would be material to the examination of this reissue application are required to be made of record in response hereto. See 37 CFR 1.175(b)."

If the additional details of the litigation appear to be material to examination of the reissue application, the examiner may make such additional inquiries as necessary and appropriate under 37 CFR 1.175(b).

However, any application which indicates the existence of *a question* of "fraud" or "violation of the duty of disclosure" will be forwarded to the Office of the Assistant Commissioner for Patents pursuant to Section 721.01, M.P.E.P., as soon as the existence of *such question* is appreciated. For example, any reissue application which seeks reexamination in view of material prior art or other information known before issuance of the patent to a person having a duty under 37 CFR 1.56(a) must be forwarded under Section 721.01, M.P.E.P., to the Assistant Commissioner via the Group Director.

The Filing of Protests Under 37 CFR 1.291

The amendments to Section 1.291 reflected the increased value the Office places on appropriate written protests as an aid in avoiding the issuance of invalid patents. The present supplemental guidelines are in addition to those previously published and referred to above.

The nature of the protest, and the timeliness of its submission, are important factors in determining the consideration which is given the protest, and by whom it is considered. Insofar as the question of timeliness is concerned, the original publication of the rules at 955 O.G. 1054, the earlier Guidelines published at 957 O.G. 11, and Section 1309.02, M.P.E.P. adequately treat this question. Protests should obviously be submitted as early in the examination process as possible in order to be of maximum benefit to the Office in its examination of the application involved.

If the protest is being filed with regard to a reissue application, the protest should be filed within the two-month period following announcement of the filing of the reissue application in the Official Gazette, if it is at all possible to do so. If, for some reason, the protest of the reissue application cannot be filed within the two-month period provided by 37 CFR 1.176, the protest can be submitted at a later time, but protestor must be aware that reissue applications are "special" and a later filed protest may be received after action by the examiner, if submitted later than the two months provided by 37 CFR 1.176. In the event a protest is intended against a reissue application, but cannot be submitted within the two months provided following the O.G. announcement, the protestor can request an additional specified period within which to file the protest, explaining why the additional time is necessary and the nature of the protest intended. A copy of any such request for additional time to protest a reissue application beyond the two months provided must be served on the reissue applicant. The request for additional time should be directed to the appropriate Group Director. The requests for additional time beyond the two months provided will be *critically reviewed as to demonstrated need* before being granted since the delay of examination of a reissue application of another party is being requested. Accordingly, the requests should be made *only where necessary, for the minimum period required* and with a justification establishing the necessity for the extension.

Any protest filed alleging "fraud" or "violation of the duty of disclosure" should be directed to the attention of the Assistant Commissioner for Patents, Building 3, Room 11A–13. Protests based on grounds other than "fraud" or "violation of the duty of disclosure" should be directed to the attention of the Director of the particular examining group in which the application is pending. If the protestor is unable to specifically identify the application to which the protest is directed, but, nevertheless, believes such an application to be pending, the protest should be directed to the attention of the Assistant Commissioner for Patents, Building 3, Room 11A–13, along with as much identifying data for the application as is available.

As indicated in the earlier publications, e.g., Section 1309.02, M.P.E.P., every effort should be made by a protestor to effect service of the protest upon the attorney or agent of applicant who is of record or upon the applicant. The protest filed in the Office should reflect that service has been made. Only in those instances where service is not possible should the protest be filed in duplicate in order that the Office can attempt service. Of course, the copy served upon applicant or applicant's attorney or agent should be accompanied by a

copy of each prior art or other document relied upon in the same manner as required by Section 1.291(a) for the Office copy.

The Examiner's Consideration of Protests

Protests other than those alleging "fraud" or "violation of the duty of disclosure" will be received by, or forwarded to, the Group Director of the examining group where the application is, or may be, pending and then referred to the appropriate examiner. If it is then, or later, discovered that a question of "fraud" or "violation of the duty of disclosure" exists, the application and the protest, will be forwarded to the Office of the Assistant Commissioner for Patents pursuant to Section 721.01, M.P.E.P.

If no allegations or questions of "fraud" or "violation of the duty of disclosure" are found to exist, the examiner will consider the protest and report the results of the consideration to the Group Director. If the protest has been timely submitted, i.e., before final rejection or allowance, the examiner will consider each of the prior art or other documents submitted. At least those prior art documents which the examiner relies on in rejecting claims will be made of record by means of form PTO–892. If the examiner does not cite all of the prior art or other documents on form PTO–892, the examiner will place a notation in the protest paper adjacent to the reference to the documents which will include the examiner's initials and the term "checked."

If the protest is filed after final rejection or allowance of the application, the consideration by the examiner will depend upon the relevance of the prior art documents submitted and the point in time at which they are submitted. Documents which clearly anticipate or render obvious one or more claims will not be knowingly ignored. Prosecution of the application will be reopened where necessary. However, protestor must be aware that the likelihood of consideration by the Examiner decreases as the patent issue date approaches. Accordingly, protests must be filed early in order to ensure their consideration.

If the protest is not accompanied by a copy of each prior art or other document relied upon as required by Section 1.291(a), the protestor cannot be assured that the examiner will consider the missing document. However, if the examiner does so, the examiner will either cite the document on form PTO–892 or place a notation in the protest paper adjacent to the reference to the document which will include the examiner's initials and the term "checked."

If, upon considering the protest or any submissions subsequent thereto, the examiner considers it desirable to obtain applicant's comments on the protest before further action, the examiner will offer applicant an opportunity to file comments within a set period, usually two months.

The following suggested format can be used to offer applicant an opportunity to file comments on the protest:

> "A protest against the issuance of a patent based on this application has been filed under 37 CFR 1.291 on _____ and a copy (has been indicated as having been served on applicant) (is attached hereto). Any comments or response applicant desires to file before consideration of the protest must be filed by _____."

Section 1.291(a) indicates that protests are acknowledged and this acknowledgement will normally be made by the particular office to which the protest is ultimately directed for consideration. Protests alleging "fraud" or "violation of the duty of disclosure" will normally be acknowledged by the Office of the Assistant Commissioner for Patents. Other protests, i.e., those not alleging "fraud" or "violation of the duty of disclosure" will normally be acknowledged by the Group Director of the examining group where the application is, or may be, pending.

If the protest involves an application to which the protestor has access, e.g., a reissue application filed after March 1, 1977, or one in which protestor has been formally granted access, then protestor may monitor the proceedings and file such additional papers as protestor considers appropriate. If protestor has access to the application, protestor may request the Office to supply protestor with copies of Office actions or other documents mailed by the Office. Such a request should be directed to the particular area in which the application is pending, e.g., Office of Assistant Commissioner for Patents, or Director of the particular examining group. The request should explain why protestor needs the copies in question and should indicate an intent on protestor's part to assist the Office in its examination by supplying relevant comments. Normally, the Office will send copies of Office actions to protestors where the protestor indicates an intent to review actions and, if appropriate, comment to the Office on them. However, since protestor has no right to copies of the Office actions or other documents, the granting or denying of such requests will be within the sole discretion of, and for the convenience of, the Office.

If the protestor has access to the application, the examiner may communicate with the protestor *in writing* to seek clarification and/or additional information if the examiner considers such clarification and/or additional information necessary to properly consider the protest. The following suggested format can be used by the examiner to seek clarification and/or additional information from a protestor having access to an application:

> "The protest, as filed_____, has been noted. However, clarification and/or additional information is desired. In particular [Examiner explains] any submission of the requested information should be made within ONE MONTH of the date of this letter and the submission must indicate service on applicant."

While the examiner should not normally need clarification and/or additional information from the protestor where the grounds involve only published prior art, e.g., patents, periodicals, etc., under some circumstances it may be necessary for the examiner to seek such clarification and/or additional information. For example, if the date of a reference is in question, or some question of public use is involved, and the information being sought is within the knowledge or control of the protestor, the examiner may find it necessary to communicate with the protestor to obtain the same.

Where the examiner feels that a protestor with access to an application can contribute significantly to the examination process, the protestor may be given a specific period, normally one month, within which to comment on responses submitted by patent applicants to Office actions. Such a comment period should only be provided where it would appear to be of benefit to the examination process and only with the approval of a Supervisory Primary Examiner. Where an applicant agrees to such participation by a protestor or where a Court has suspended litigation for consideration of a related application by the Patent and Trademark Office with an expression of its desire for such protestor participation, it should be more liberally granted.

Where a protestor requests permission to participate in any interview between an applicant and the examiner or requests on its own behalf to have an interview with the examiner, the request should be referred to the Office of the Assistant Commissioner for Patents for action. Normally, protestor participation in interviews with examiners will not be allowed unless special justifying circumstances exist. Where authorized, participation by the protestor in an interview will be according to conditions set down by the Patent and Trademark Office. Normally, any transcript of the interview, if authorized, will be at the expense of the party or parties requesting it and will be arranged by such party or parties. Where Office actions are being sent to a protestor or where a protestor is present for an interview, a copy of the Interview Summary Form and other records made of the interview will be provided to the protestor. Where protestor's participate in an interview, they may submit their own record of the interview which will be made of record in the file.

Interviews relating to a patent application with a protestor will not be permitted without the applicant present.

A protestor with access to an application appealed to the Board of Appeals who intends to file comments or a brief in opposition to appellant's brief should file an indication of such intention within one month after the notice of appeal is filed and serve a copy of the same upon appellant. The indication of intention should state that protestor agrees to file such comments or brief in triplicate, within one month after appellant's brief is filed, and also agrees to serve a copy of the comments or brief upon appellant. If such an indication is not filed and served, or the protestor's comments or brief is not timely filed in triplicate and served, no assurance is given that the Examiner will consider the protestor's comments or brief during the preparation of the Examiner's Answer.

A protestor who participates by the filing of comments or a brief in opposition to appellant's brief may also request, at

the time of filing the comments or brief, to appear at any oral hearing. If a protestor does not file such comments or brief, the protestor cannot be present at any oral hearing. If a protestor does file such a request, the Board of Appeals, in its discretion, will decide whether or not the issues on appeal are such that protestor's participation at the hearing would be helpful. The Board of Appeals will notify protestor whether or not the request to appear at the hearing is granted and, if granted, how much time will be permitted. Of course, if appellant does not request an oral hearing, or provides timely notification to the Board and protestor that appellant will not appear, protestor will not be heard.

A copy of any examiner's letter or communication to a protestor will be mailed to applicant at the same time it is mailed to the protestor. While the examiner may communicate *in writing* with a protestor having access to the application, the examiner will *not* communicate orally and protestor must refrain from oral communications with the examiner except to ask purely procedural questions which have no relation to the substance of the protest or the merits of the application, unless specifically authorized *in writing* by the Assistant Commissioner for Patents.

Where the handling of a protest or the handling of a reissue application involved in related litigation requires an inordinately larger than normal amount of work on the part of an examiner and where otherwise warranted, Supervisory Primary Examiners may authorize the use of non-examining time for handling some or all of the examination.

The above guidelines are intended to make clearer the policies of the Patent and Trademark Office in respect to the handling of reissue applications, protests and "fraud" questions. The Office is especially interested in seeing that the consideration of reissue applications and protests is thorough and fair. It is interested in seeing that protestors have an opportunity to participate in the proceedings in the Office to the extent that such participation is helpful and appropriate in each case. It is also greatly interested in the completeness and accuracy of the file record, including indications whether or not prior art references and information mentioned in the record have been reviewed by the examiner.

The present guidelines which will be incorporated into the M.P.E.P. as soon as possible, when considered in conjunction with those previously issued and the M.P.E.P., should answer many of the questions being raised about the revised rules.

DONALD W. BANNER,
Commissioner of Patents & Trademarks.

Nov. 13, 1978.

[977 OG 11]

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(68) DEPOSIT OF COMPUTER PROGRAM LISTINGS

[37 CFR Part 1]

Notice of Proposed Rulemaking

AGENCY: Patent and Trademark Office, Commerce.

ACTION: Proposed Rule.

SUMMARY: This proposed rule would amend the rules of practice to provide special procedures for presentation of computer program listings in patent applications. This proposal would reduce the present burden of presenting such listings on paper and would also reduce expenses for both the patent applicant and the Patent and Trademark Office.

DATES: Comments must be received on or before: September 13, 1977. Hearing: September 13, 1977, beginning at 9:30 a.m.

ADDRESSES: Send comments to: Commissioner of Patents and Trademarks, Washington, D.C. 20231. The hearing will be held in Room 11C24 of Building 3, Crystal Plaza, at 2021 Jefferson Davis Highway, Arlington, Virginia. Written comments and transcript of hearing will be available for public inspection in Room 11E10 of Building 3, Crystal Plaza, at 2021 Jefferson Davis Highway, Arlington, Virginia.

FOR FURTHER INFORMATION CONTACT: Mr. Louis O. Maassel by telephone at (703) 557-3070, or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

SUPPLEMENTARY INFORMATION: Notice is hereby given that, pursuant to the authority contained in section 6 of the Act of July 19, 1952, as amended (68 Stat. 793; 85 Stat. 364; 88 Stat. 1949; 35 U.S.C. 6 as amended) the Patent and Trademark Office proposes to amend Title 37 of the Code of Federal Regulations by amending Sections 1.21 and 1.77 and by adding a new Section 1.96. This proposal has been reviewed pursuant to E.O. 11821 and OMB Circular A-107 and determined to have no major inflationary impact.

The purpose of the proposed rule change is to provide suitable procedures for presenting computer program listings where such listings are submitted with applications for patent to fulfill the disclosure requirements under 35 U.S.C. 112.

This proposal does not in any way imply that the Patent and Trademark Office considers computer programs per se to be patentable subject matter.

The provisions of 37 CFR Sections 1.52 and 1.84 were developed for and are suitable for the specification and drawings of most patent applications. However, when lengthy computer program listings must be included in order to provide a complete disclosure, their presentation in the conventional manner can become burdensome.

The cost of printing long computer programs or routines in patent documents is very expensive to the Office. The issue fees for the applicant, which are based on the number of pages or sheets, are correspondingly high.

Proposed new Section 1.96 sets forth alternative methods for presentation of such listings. Under paragraph (a), relatively short computer program listings (10 printout pages or less) will be printed as part of the patent. Paragraph (b) provides for submitting computer program listings which are 51 or more paper pages in length in the form of microfiche as an appendix. Computer program listings 11–50 pages in length may be submitted under the provisions of either paragraphs (a) or (b). Appendices on microfiche will not be printed in the patent but will become publicly available on the date the patent is issued. After patenting, the appendix will be prior art under 35 U.S.C. 102(e) as of the filing date of the application with which it was filed. Various incorporations by reference have been approved by the courts in *General Electric Company* v. *Brenner*, 159 USPQ 335; In re Hawkins, 179 USPQ 157, and In re Argoudelis et al., 168 USPQ 99.

Copies of publicly available computer program listing appendices may be purchased either as microfiche (148 mm x 105 mm card) at $1.00 per microfiche or as printed out on paper copy 30¢ per page.

The micrographic standards referred to in proposed Section 1.96(b)(2) may be obtained from either the National Micrographic Association, 8728 Colesville Road, Silver Spring, Maryland 20910 or the American National Standards Institute, 1430 Broadway, New York, New York, 10018.

1. Section 1.21 is proposed to be amended by adding a new paragraph (1) to read as follows:

Section 1.21. *Patent and miscellaneous fees and charges.*

* * * * *

(1) The fee for obtaining a microfiche copy, per microfiche $1.00

* * * * *

2. Section 1.77 is proposed to be amended by revising paragraph (c) to read as follows:

Section 1.77. *Arrangement of application.*

* * * * *

(c) (1) Cross-reference to related applications, if any.
(2) Reference to material incorporated by reference, if any. (See Sections 1.96(b) and (c)).

* * * * *

3. A new Section 1.96 is proposed to be added which reads as follows:

Section 1.96. *Submission of computer program listings.*

Computer program listings may be submitted in the following forms:

(a) *As part of application which is to appear in the patent.* If the computer program listing is contained on 10 printout pages or less, it may be submitted either as drawings or as part of the specification.

(1) *Drawings.* The listing may be submitted in the manner and complying with the requirements for drawings as provided in Section 1.84. At least one figure numeral is required on each sheet of drawing.

(2) *Specification.*

(i) The listing may be submitted as part of the specification in accordance with the provisions of Section 1.52, at the end of the description but before the claims.

(ii) The listing may be submitted as part of the specifi-

cation in the form of computer printout sheets commonly (11 by 14 inches in size) for use as "camera ready copy" when a patent is subsequently printed. Such computer printout sheets must be original copies from the computer with dark solid black letters, on white, unshaded and unlined paper, the printing on each sheet must be limited to an area 9 inches high by 11 inches wide, and the sheets should be submitted in a protective cover. When printed in patents, such computer printout sheets will appear at the end of the description but before the claims and will be reduced about ½ in size with two printout sheets being printed as one patent specification page. Any corrections must be made by way of substitute sheets.

(b) *As an appendix which will not be printed.* If a computer program listing printout is more than 51 pages long, applicants must submit such listing in the form of microfiche, referred to in the specifications. The microfiche filed with a patent application is referred to as an appendix. The microfiche appendix will not be part of the printed patent. Reference in the application to the appendix should be made at the location indicated in Section 1.77(c).

(1) *Availability of appendix.* Such computer program listings on microfiche will be available to the public, and paper or microfiche copies will be available for purchase, after a patent is granted based on such an application. Any corrections must be made by way of revised microfiche.

(2) *Submission requirements.* Computer-generated information submitted as an appendix to an application for patent shall be in the form of microfiche in accordance with the standards set forth in National Micrographics Association (NMA) Standards—

MS1—Quality Standards for Computer Output Microfilm

MS2 (ANSI PH 5.18–1976)—Format and Coding Standards for Computer Output Microfilm

MS5 (ANSI PH 5.9–1975)—Microfiche of Documents

ANSI PH 2.19–1959—"Diffuse Transmission Density"—except as modified or clarified below:

(i) Film submitted shall be first generation (camera film) negative appearing microfiche (wth emulsion on the back side of the film when viewed with the images right reading).

(ii) Either Computer-Output-Microfilm (COM output or copies of photographed paper copy may be submitted. In the former case, NMA standards MS1 and MS2 apply; in the latter case, standard MS5 applies.

(iii) Reduction ratio of microfiche submitted should be 24:1 or a similar ratio where variation from said ratio is required in order to fit the documents into the image area of the microfiche format used.

(iv) Film submitted shall have a thickness of at least .005 inches (0.13 mm) and not more than .009 inches (0.23 mm) for either cellulose acetate base or polyester base type.

(v) Both microfiche formats A1 (98 frames, 14 columns x 7 rows) and A3 (63 frames, 9 columns x 7 rows) which are described in NMA standard MS2 (A1 is also described in MS5) are acceptable for use in preparation of microfiche submitted.

(vi) At least the left-most ½ (50 mm x 12 mm) of the header of each microfiche submitted shall be clear or positive appearing so that the Patent and Trademark Office can apply serial number and filing date thereto in an eye-readable form. The middle portion of the header shall be used by applicant to apply an eye-readable application title together with inventor's name and any other bibliographic information the applicant sees fit to include. The final right-hand portion of the microfiche shall contain sequence information for the microfiche such as 1 of 4, 2 of 4, etc.

(vii) Additional requirements which supply specifically to microfiche of filmed paper copy or COM microfiche:

(a) Microfiche of filmed paper copy.

(1) The first frame of each microfiche submitted shall contain a standard NBS Microcopy Resolution Test Chart (No. 1010A).

(2) The second frame of each microfiche submitted must contain a fully descriptive title.

(3) The pages appearing on the microfiche frames should be consecutively numbered.

(4) Pagination of the microfiche frames shall be left to right and from top to bottom.

(5) At a reduction of 24:1 resolution of the original microfilm shall be at least 120 lines per mm (5.0 target) so that reproduction copies may be expected to comply with provisions of paragraph 7.1.4 of NMA Standard MS5.

(6) Background density of negative-appearing camera master microfiche of filmed paper documents shall be within the range 0.9 to 1.2 and line density should be no greater than 0.08. The density shall be visual diffuse density as measured using the method described in ANSI Standard PH 2.19–1959.

(7) A suitable index should be included on each microfiche.

(b) Microfiche generated by COM.

(1) Background density of negative-appearing COM-generated camera master microfiche shall be within the range of 1.7 to 2.0 and line density should be no greater than 0.2. The density shall be visual diffuse density as described in ANSI PH 2.19–1959.

(2) The first frame of each microfiche submitted shall contain a resolution test frame in conformance with NMA Standard MS1 (3.1.1).

(3) The second frame of each microfiche submitted must contain a fully descriptive title together with any other suitable index or other appropriate information.

(4) The pages appearing on the microfiche frames should be consecutively numbered.

(5) It is preferred that pagination of the microfiche frames be from left to right and top to bottom but the alternative, i.e., from top to bottom and from left to right, is also acceptable.

(c) *Optional use of either paragraph (a) or (b).* If the computer program listing is 11–50 pages long, applicants may utilize either the procedures of paragraph (a) or (b) of this section.

June 1, 1977. C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Approved June 7, 1977.

JORDAN J. BARUCH,
Assistant Secretary for Science and Technology.

[FR Doc. 77-17030; Filed 6-14-77; 8:45 a.m.]
42 FR 30522, June 15, 1977

[960 O.G. 2]

(Pending—No Final Action Taken)

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(69) PRACTICE RE: APPLICATIONS INVOLVING COMPUTER PROGRAMS

On November 18, 1976, the Court of Customs and Patent Appeals decided the cases of *In re Noll* and *In re Chatfield*. In both cases the Board of Appeals had taken the position that the claims were drawn to non-statutory subject matter under the Supreme Court's decision in *Gottschalk* v. *Benson*, 409 U.S. 63, 175 USPQ 673 (1972). The Noll application claims were drawn to an apparatus and the Chatfield application claims were drawn to a method.

The CCPA reversed the Board of Appeals in both cases. Until these decisions become final and since further review or clarification may be forthcoming, the patent examining corps will continue to examine computer programming applications in accordance with its current interpretation of the Supreme Court decision in the Benson case.

Prosecution will be resumed on all applications previously suspended under 37 CFR 1.103(b). No further programming applications will be suspended at the instance of the Office.

C. MARSHALL DANN,
Dec. 14, 1976. *Commissioner of Patents and Trademarks.*

[954 O.G. 550]

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(70) PRIORITY CLAIMS BASED ON INVENTORS' CERTIFICATES

Pursuant to the provisions of 35 U.S.C. 119, last paragraph (as amended July 28, 1972), 37 CFR 1.55(c) requires that when an applicant wishes to claim a right of priority on the basis of an application for an inventor's certificate, ". . . the applicant or his attorney or agent, when submitting a claim for such right . . . shall include an affidavit or declaration including a specific statement that, upon an investigation, he has satisfied himself that to the best of his knowledge the applicant, when filing his application for the inventor's certificate, had the option to file an application either for a patent or for an inventor's certificate as to the subject matter of the identified claim or claims forming the basis for the claim of priority."

As such, it has been and remains the position of the Patent and Trademark Office that, in accordance with 35 U.S.C. 119, applications for inventors' certificates shall give rise to a right of priority only when the country in which they are filed gives to applicants, at their discretion, the right to apply, on the same invention, either for a patent or for an inventor's certificate. The affidavit or declaration specified under 37 CFR 1.55(c) is only required for the purpose of ascertaining whether, in the country where the application for an inventor's certificate originated, this option generally existed for applicants with respect to the particular subject matter of the invention involved. The requirements of 35 U.S.C. 119 and 37 CFR 1.55(c) are not intended, however, to probe into the eligibility of the particular applicant to exercise the option in the particular priority application involved.

It is recognized that certain countries that grant inventors' certificates also provide by law that their own nationals who are employed in state enterprises may only receive inventors' certificates and not patents on inventions made in connection with their employment. This will not impair their right to be granted priority in the United States based on the filing of the inventor's certificate.

Accordingly, affidavits or declarations filed pursuant to 37 CFR 1.55(c) need only show that in the country in which the original inventor's certificate was filed, applicants generally have the right to apply at their own option either for a patent or an inventor's certificate as to the particular subject matter of the invention.

C. MARSHALL DANN,
Aug. 17, 1977. *Commissioner of Patents and Trademarks.*

[962 OG 14]

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(71) REQUIREMENTS FOR PRIORITY DOCUMENTS, PRIORITY BASED ON APPLICATION FOR INDUSTRIAL DESIGN

In the Federal Republic of Germany, an application for protection of an industrial design may be accompanied by either a model or a drawing. It is understood that German residents file such applications with their local judicial authority ("Amtsgericht") rather than with the German Patent Office in Munich.

Questions have been raised in this connection as to:

(1) What sort of priority document under 35 U.S.C. 119 is required when the original filing has comprised a model rather than a drawing, and

(2) Whether it is necessary where the original filing was with a local judicial authority to obtain also a certificate from the national patent office.

As to the first question, the Patent and Trademark Office will receive under 35 U.S.C. 119, as evidence of an earlier filed design application which included the deposit of a model, drawings or acceptable photographs of the deposited model faithfully reproducing the design embodied therein together with other required information, certified by an official of the court or office with which the application was originally filed.

No additional certification by the national patent office will be required. Article 4D(3) of the Paris Convention refers to certification ". . . by the authority which received such application . . ." so the reference in 35 U.S.C. 119 to "patent office" will be construed to extend also to the authority in charge of the design register.

Aug. 15, 1977. C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

[962 OG 14]

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(72) RIGHT OF PRIORITY (35 U.S.C. 119) BASED ON A FOREIGN APPLICATION FILED UNDER A BILATERAL OR MULTILATERAL TREATY

Under Article 4A of the Paris Convention for the Protection of Industrial Property (21 UST 1583; 24 UST 2140; TIAS 6923, 7727; 852 O.G. 511) a right of priority may be based either on an application filed under the national law of a foreign country adhering to the Convention or on a foreign application filed under a bilateral or multilateral treaty concluded between two or more such countries. Examples of such treaties are the Hague Agreement Concerning the International Deposit of Industrial Designs, the Benelux Designs Convention, and the Libreville Agreement of September 13, 1962, relating to the creation of an African and Malagasy Industrial Property Office. The Convention on the Grant of European Patents and the Patent Cooperation Treaty will be further examples of such treaties once they enter into force.

The Priority Claim

In claiming priority of a foreign application previously filed to the Patent and Trademark Office. In addition to the filed under such a treaty, certain information must be sup- application number and the date of the filing of the application, the following information is required: (1) the name of the treaty under which the application was filed, (2) the name of at least one country other than the United States in which the application has the effect of, or is equivalent to, a regular national application, and (3) the name and location of the national or intergovernmental authority which received such application.

Certification of the Priority Papers

Section 119 of Title 35 of the United States Code requires the applicant to furnish a certified copy of priority papers. Certification by the authority empowered under a bilateral or multilateral treaty to receive applications which give rise to a right of priority under Article 4A(2) of the Paris Convention will be deemed to satisfy the certification requirement.

Aug. 9, 1977. C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

[962 OG 2]

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(73) ABSTRACT OF THE DISCLOSURE

This notice is intended to announce a change in the examining practice concerning review of the abstract for compliance with the guidelines set forth in MPEP 608.01(b).

At present, the examiner is instructed to review the abstract for compliance with the guidelines when passing the case to issue, making any necessary revisions by examiner's amendment. This policy has led to the necessity for many changes by the examiner which could have and should have been made at an earlier point in the prosecution. For example, abstracts in excess of the 250 word limit require cancellation and/or rewriting of portions thereof. This 250 word limit is strictly enforced since it represents a requirement of the printing process and the printed patent format designed to present a maximum amount of information concerning a patent on a single page.

Effective immediately, examiners are to require correction of the abstract at the earliest point in the prosecution that non-compliance with the guidelines is detected. Applicants are expected to observe the guidelines in drafting the abstract and correct any defect that is identified in an Office action. Applicants are encouraged to make the necessary corrections not only to relieve the examiner of this burden, but also to help avoid any potential conflict with respect to altering the scope of the enabling disclosure. In this regard, it should be noted that the abstract of the disclosure has been interpreted to be a part of the specification for the purposes of compliance with paragraph 1 of 35 USC 112. *In re Armbruster*, 512 F2d 676, 185 USPQ 152 (CCPA 1975). However, although it is preferable for applicant to make any necessary changes, the examiner will retain the authority and responsibility for reviewing, editing and revising the abstract of the disclosure at the time of allowance of the application to assure compliance with the guidelines.

Section 608.01(b) of the Manual of Patent Examining Procedures will be amended appropriately.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

Dec. 30, 1977.

[967 OG 2]

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(74) SUPPLEMENTAL GUIDELINES FOR THE IMPLEMENTATION OF 37 CFR 1.109—REASONS FOR ALLOWANCE

A recent review of recorded statements of reasons for allowance indicates the need for a better understanding regarding implementation of new Rule 109 (37 CFR 1.109). These guidelines are supplemental to those published in the OFFICIAL GAZETTE at 957 O.G. 11 on April 12, 1977 and amplified in Section 1302.14 MPEP, Rev. 52, April 1977.

In determining whether reasons for allowance should be recorded the primary consideration lies in the first sentence of the Rule:

> "If the examiner believes that the record of the prosecution *as a whole* does not make clear his reasons for allowing a claim or claims, the examiner may set forth such reasoning." (Emphasis added.)

In most cases the examiner's actions and the applicant's response make evident the reasons for allowance, satisfying the "record as a whole" proviso of the rule. This is particularly true when applicant fully complies with 37 CFR 1.111 (b) and (c), 37 CFR 1.119 and 37 CFR 1.133(b). Thus where the examiner's actions clearly point out the reasons for rejection and the applicant's response explicitly represents reasons why claims are patentable over the reference, the reasons for allowance are in all probability evident from the record and no statement should be necessary. Conversely, where the record is not explicit as to reasons, but allowance is in order, then a logical extension of 37 CFR 1.111, 1.119 and 1.133 would dictate that the examiner should make reasons of record and such reasons should be specific.

Where specific reasons are recorded by the examiner, care must be taken to insure that such reasons are accurate, precise and do not place unwarranted interpretations, whether broad or narrow, upon the claims. The examiner should keep in mind the possible misinterpretations of his statement that may be made and its possible estoppel effects. Each statement should include at least: (1) the major difference in the claims not found in the prior art of record, and (2) the reasons why that difference is considered to define patentably over the prior art if either of these reasons for allowance is not clear in the record. The statement is not intended to necessarily state all the reasons for allowance or all the details why claims are allowed and should not be written to specifically or impliedly state that all the reasons for allowance are set forth.

Under the rule, the examiner must make a judgement of the individual record to determine whether or not reasons for allowance should be set out in that record. These guidelines, then, are intended to aid the examiner in making that judgement. They comprise illustrative examples as to applicability and appropriate content. They are not intended to be exhaustive.

Examples of When It Is Likely That a Statement Should Be Added to the Record

1. Claims are allowed on the basis of one (or some) of a number of arguments and/or affidavits presented and a statement is necessary to identify which of these were persuasive, for example:
   a. When the arguments are presented in an appeal brief.
   b. When the arguments are presented in an ordinary response with or without amendment of claims.
   c. When both an affidavit under 37 CFR 1.131 and arguments under 102 and 103 are presented.
2. First action issue:
   a. Of non-continuing application wherein claims are very close to cited prior art and differences have not been discussed elsewhere.
   b. Of continuing applications wherein reasons for allowance are not apparent from the record in the parent case or clear from preliminary filed matters.
3. Withdrawal of a rejection for reasons not suggested by applicant, for example:
   a. As a result of an appeal conference.
   b. When applicant's arguments have been misdirected or are not persuasive alone and the Examiner comes to realize that more cogent argument is available.
   c. When claims are amended to avoid a rejection under 35 USC 102 but arguments (if any) fail to address the question of obviousness.
4. Allowance after remand from the Board of Appeals.
5. Allowance coincident with the citation of newly found references that are very close to the claims, but claims are considered patentable thereover:
   a. When reference is found and cited (but not argued) by applicant.
   b. When reference is found and cited by Examiner.
6. Where the reasons for allowance *are* of record but in the Examiner's judgement, are unclear (e.g. spread throughout the file history) so that an unreasonable effort would be required to collect them.
7. Allowance based on claim interpretation which might not be readily apparent, for example:
   a. Article claims in which method limitations impart patentability.
   b. Method claims in which article limitations impart patentability.
   c. Claim is so drafted that "non-analogous" art is not applicable.
   d. Preamble or functional language "breathes life" into claim.

Examples of Statements of Suitable Content

1. The primary reason for allowance of the claims is the inclusion of .03 to .05 percent nickel in all the claims. Applicant's second affidavit, in example 5 shows unexpected results from this restricted range.
2. During two telephonic interviews with applicant's attorney, Mr. — on 5/6 and 5/10/77, the Examiner stated that Applicant's remarks about the placement of the primary teaching's grid member were persuasive, but he pointed out that applicant did not claim the member as being within the reactor. Thus, an amendment doing such was agreed to.
3. The instant application is deemed to be directed to an unobvious improvement over the invention patented in Pat. No. 3,953,224. The improvement comprises baffle means *12* whose effective length in the extraction tower may be varied so as to optimize and to control the extraction process.
4. Upon reconsideration, this application has been awarded the effective filing date of S.N. ————. Thus the rejection under 35 USC 102(d) and 103 over Belgian Patent No. 757,246 is withdrawn.
5. The specific limitation as to the pressure used during compression was agreed to during the telephone interview with applicant's attorney. During said interview, it was noted that applicants contended in their amendment that a process of the combined applied teachings could not result in a successful article within the amended pressure range. The Examiner agreed to rely on this statement (see page 3, bottom, of applicant's amendment), and the case was allowed.
6. In the Examiner's opinion, it would not be obvious to a person of ordinary skill in the art first to eliminate

one of top members 4, second to eliminate plate 3, third to attach remaining member 4 directly to tube 2 and finally to substitute this modified handle for the handle 20 of Nania (see Fig. 1) especially in view of applicant's use of term "consisting."

Examples of Statements That Are Not Suitable as to Content

1. The 3 roll press couple has an upper roll 36 which is swingably adjustable to vary the pressure selectively against either of the two lower rolls. (NOTE: The significance of this statement may not be clear if no further explanation is given.)
2. The main reasons for allowance of these claims are applicant's remarks in the appeal brief and an agreement reached in the appeals conference.
3. The instant composition is a precursor in the manufacture of melamine resins. A thorough search of the prior art did not bring forth any compositions which corresponds to the instant compositions. The Examiner in the art also did not know of any art which could be used against the instant composition.
4. Claims 1–6 have been allowed because they are believed to be both novel and unobvious.

The examiner should *not* include in his statement any matter which does not relate directly to the reasons for allowance. For example:

5. Claims 1 and 2 are allowed because they are patentable over the prior art. If applicants are aware of better art than that which has been cited, they are required to call such to the attention of the Examiner.
6. The reference Jones discloses and claims an invention similar to applicant's. However, a comparison of the claims, as set forth below, demonstrates the conclusion that the inventions are non-interfering.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

Jan. 24, 1978.

[968 OG 6]

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(75) PRACTICE/RE: NEW GROUNDS OF REJECTION AFTER APPEAL BRIEF HAS BEEN FILED

A new practice has been implemented in the Patent Examining Corps to promote uniformity and adherence to guidelines in situations where a new ground of rejection is made in an Office action after an appeal brief has been filed. Under this practice Supervisory Patent Examiner approval is required for any new ground of rejection made after the filing of an Appeal Brief. This requirement extends to new grounds of rejection made either in an examiner's answer or in an Office action reopening prosecution. Evidence of that approval should appear on applicant's copy of the Office action or answer as well as the record copy. Consultation with or approval by the Group Director is no longer required in these situations.

This new practice does not alter the existing guidelines for reopening prosecution (MPEP) 706.7(e)) or for making a new ground of rejection in an examiner's answer (MPEP 1208.01). Appropriate modifications will be made to applicable Sections of the Manual of Patent Examining Procedure in a future revision.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

[970 OG 94 (5–23–78)]

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(76) COMMERCIAL SUCCESS AND OTHER CONSIDERATIONS BEARING ON OBVIOUSNESS

In order to clarify Office practice relative to considerations of commercial success and other items bearing on obviousness, the following changes are being made in the Manual of Patent Examining Procedure.

In section 716, subsection 4, change the sub-title and first paragraph to read as follows:

4. *Commercial Success and Other Considerations Bearing on Obviousness*

Affidavits or declarations submitting evidence of commercial success, long-felt but unsolved needs, failure of others, etc., must be considered by the Examiner in determining the issue of obviousness of claims for patent-ability under 35 U.S.C. 103. Such evidence might be utilized to give light to circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or unobviousness, such evidence may have relevancy. *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966); *In re Palmer*, 172 USPQ 126, 451 F.2d 1100 (CCPA 1971); *In re Fielder and Underwood*, 176 USPQ 300, 471 F.2d 640 (CCPA 1973). The *Graham* v. *John Deere* pronouncements on the relevance of commercial success, etc. to a determination of obviousness were not negated in *Sakraida* v. *Ag Pro*, 425 U.S. 273, 189 USPQ 449 (1976) or *Andersons Black Rock, Inc.* v. *Pavement Salvage Co., Inc.*, 396 U.S. 57, 163 USPQ 673 (1969), where reliance was placed upon *A & P Tea Co.* v. *Supermarket Corp.*, 340 U.S. 147 87 USPQ 303 (1950). See *Dann* v. *Johnston*, 425 U.S. 219, 189 USPQ 257 (1976), at 261, footnote 4.

The weight attached to evidence of commercial success, etc. by the Examiner will depend upon its materiality to the issue of obviousness and the amount and nature of the evidence. Note the great reliance apparently placed on this type of evidence by the Supreme Court in upholding the patent in *United States* v. *Adams*, 383 U.S. 39, 148 USPQ 479 (1966).

Evidence of commercial success, etc. must be commensurate in scope with the scope of the claims [*In re Tiffin*, 448 F.2d, 791, 171 USPQ 294 (1971)]. Further in considering evidence of commercial success, care should be taken to evaluate, to the extent possible from the evidence submitted, whether the commercial success alleged is directly derived from the invention claimed, in a marketplace where the consumer is free to choose on the basis of objective principles, and that such success is *not* the result of heavy promotion or advertising, shift in advertising consumption by purchasers normally tied to applicant or assignee, or other business events extraneous to the merits of the claimed invention, etc. [*In re Mageli et al*, 176 USPQ 305, (CCPA 1973)]; [*In re Noznick et al*, 178 USPQ 43, (CCPA 1973)].

Similarly in considering evidence of longfelt but unsolved needs and failure of others, care should be taken to determine whether such failures were due to lack of interest or appreciation of an invention's potential or marketability rather than want of technical know-how [*Scully Signal Co.* v. *Electronics Corp. of America*, 196 USPQ 657 (1st Cir. 1977)].

In section 716, subsection 4, add the following as the last paragraph:

If, after evaluating the evidence, the examiner is still not convinced that the claimed invention is patentable, his action should include a simple statement to that effect, identifying the reason(s) (e.g., evidence of commercial success not convincing, the commercial success not related to the technology, etc.).

July 10, 1978. RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

[973 OG 34]

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(77) HANDLING OF DEPENDENT CLAIMS BY THE EXAMINER

Effective immediately, the following practice will be followed by patent examiners when making reference to a dependent claim—either singular or multiple. The new practice is intended to simplify and streamline our current practice (MPEP 608.01(n), Revision 55, January 1978) which experience indicates was unnecessarily burdensome in many cases.

1. When identifying a singular dependent claim which does not include a reference to a multiple dependent claim, either directly or indirectly, reference should be made only to the number of the dependent claim.
2. When identifying the embodiments included within a multiple dependent claim, or a singular dependent claim which includes a reference to a multiple dependent claim, either directly or indirectly, each embodiment should be identified by using the number of the claims involved, starting with the highest, *to the extent necessary* to specifically identify each embodiment.
3. When all embodiments included within a multiple dependent claim or a singular dependent claim which includes a reference to a multiple dependent claim, either directly or indirectly, are subject to a common rejection, objection or requirement, reference may be made only to the number of the dependent claim.

The following table illustrates the intended differences between current and the revised practice where each embodiment of each claim must be treated on an individual basis:

Claim Number	Claim Dependency	Identification	
		Current Practice	Revised Practice
1	Independent	1	1
2	Depends from 1	2/1	2
3	Depends from 2	3/2/1	3
4	Depends from 2 or 3	4/2/1	4/2
		4/3/2/1	4/3
5	Depends from 3	5/3/2/1	5
6	Depends from 2, 3 or 5	6/2/1	6/2
		6/3/2/1	6/3
		6/5/3/2/1	6/5
7	Depends from 6	7/6/2/1	7/6/2
		7/6/3/2/1	7/6/3
		7/6/5/3/2/1	7/6/5

When all embodiments in a multiple dependent claim situation (claims 4, 6 and 7 above) are subject to a common rejection, objection or requirement, reference may be made only to the number of the individual dependent claim. For example, if 4/2 and 4/3 were subject to a common ground of rejection, reference should be made only to claim 4 in the statement of that rejection.

The provisions of 35 USC 132 require that each Office action make it explicitly clear what rejection, objection and/or requirement is applied to each claim embodiment.

WILLIAM FELDMAN,
Oct. 17, 1978. *Deputy Assistant Commissioner.*

[976 OG 128]

APPEALS

(78) HEARINGS BEFORE THE BOARD OF APPEALS

In recent years the backlog of cases awaiting decision by the Board of Appeals has grown substantially. The average time elapsing between filing of the examiner's answer and final disposition is now roughly 17 months. Intensive effort by the Board and greater use of acting examiners-in-chief have been sucessful in raising the number of dispositions, but at the same time the number of appeals continues to grow. Thus in the first six months of 1974, the Board disposed of 1,193 appeals but received 1,915; in the last half of the year the Board disposed of 1,993 appeals but received 2,179.

In this connection it will be helpful if applicants and attorneys will dispense with oral hearings except where unusual circumstances are present which make a hearing important to the decision. Appeals submitted on brief receive just as careful consideration as those in which oral argument is presented, nor are any implications drawn as to the merits of the appeal from failure to request a hearing. It has been the Board's experience that in the ordinary case the hearing is not of great value in arriving at the ultimate decision.

Appellants are also encouraged to review cases where a hearing has already been requested, with a view to withdrawing the request if it is not necessary. It is particularly important that the Board be given timely notice whenever circumstances prevent the applicant or his representative from appearing at a scheduled hearing.

Rule 194 (37 CFR 1.194) limits oral argument to thirty minutes unless otherwise ordered by the Board. It has been the Board's experience, however, that effective arguments can be presented in less than thirty minutes in most cases. Effective immediately the Board will be informing appellants in the notices of hearing mailed to them that oral argument will be limited to *twenty minutes* unless otherwise ordered before the hearing begins.

The assistance of the public will be appreciated.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Date: Mar. 20, 1975.

[933 O.G. 1010]

(79) REPLY BRIEFS

Applicants should clearly and specifically indicate in their reply briefs the new points of argument "raised in the examiner's answer" to which said reply briefs are directed. Rule 193(b) does not permit general rebuttal of each statement made in the examiner's answer; Consequently a reply brief which is not restricted to answering "new points" may be refused consideration in toto.

EDWIN L. REYNOLDS,
Apr. 15, 1969. *First Assistant Commissioner.*

[862 O.G. 343]

(80) APPEALS—CONFIDENTIAL MEMORANDA

The practice of presenting confidential memoranda to the Board of Appeals is hereby terminated. All correspondence with the Board of Appeals, whether by the Examiner or the applicant will be on the record. No unpublished decisions which are unavailable to the general public by reason of 35 U.S.C. 122 will be cited by the Examiner or the applicant except that either the Examiner or the applicant has the right to cite an unpublished decision in an application having common ownership with the application on appeal.

WILLIAM E. SCHUYLER, JR.,
July 28, 1970. *Commissioner of Patents.*

[877 O.G. 733]

(81) INTERFERENCES

Listing of Attorneys or Agents in Final Decisions

A recent inquiry was made at the Board of Patent Interferences relating to the listing of attorneys' names in the heading of the final decisions of the Board of Patent Interferences.

Since this is a matter that may be of interest to those who prosecute interferences in the United States Patent and Trademark Office, the present practice of the Board of Patent Interferences is set forth below.

The heading of final decisions of the Board of Patent Interferences separately lists the names of all attorneys, agents or firms recognized as representing a party in the interference. Since firms have not been recognized by the Office since July 2, 1971, the listing of firm names is limited to firms of record in applications filed prior to July 2, 1971, and in unexecuted continuations or divisions thereof (Rule 60).

The names of the attorneys, agents or firms are taken from the interference file wrapper. The noted file wrapper lists the attorney or agent or firm of record in the applications or patent involved in the interference. Additionally, the name of any attorney presenting a party's oral argument at the final hearing is separately listed.

If a party desires to correct a firm name or exclude an attorney or agent previously of record from the above-noted decision, steps should be taken *promptly* to correct the files involved in the interference. This should be done by proceeding pursuant to the provisions of Rule 36, or by taking such other action as the party deems appropriate.

WALTER A. MODANCE,
May 6, 1975. *Chairman, Board of Patent Interferences.*

[935 O.G. 3]

(82) INTERFERENCE PRACTICE

Settlement Agreements

Inquiries by attorneys have been made from time to time at the Board of Patent Interferences as to why the Commissioner does not give notice to the parties or their attorneys of record, a reasonable time prior to termination of an interference, of the requirement relative to the filing of settlement agreements, citing 35 USC 135(c), second paragraph.

Attention is called to the fact that notice is given in the second full paragraph of Form POL–76, the letter to the parties advising them of the declaration of the interference.

WALTER A. MODANCE,
Oct. 15, 1975. *Chairman, Board of Patent Interferences.*

[940 O.G. 570]

(83) ACCESS TO INTERFERENCE SETTLEMENT AGREEMENTS BY GOVERNMENT AGENCIES

Under the provisions of 35 U.S.C. § 135(c), a party to an interference filing a copy of a settlement agreement may request that the copy be kept separate from the file of the interference, and made available only to Government agencies on written request, or to any person on a showing of good cause.

In order to provide the parties with a record of the inspection of such agreements by Government agencies, a representative of an agency will henceforth be required to present a written request, similar to the following, for each interference in which the inspection and/or copying of the agreement(s) is desired:

Date: _____

To: Clerk, Board of Patent Interferences

Pursuant to the provisions of 35 USC 135(c), please permit _____, the bearer(s) of this letter, to [ ] inspect and/or [ ] copy the settlement agreement(s) filed in Interference No. _____. The information gained from such inspection and/or copying will be kept in confidence and will not be disclosed to any other person except for official investigative or law enforcement purposes.

_____
Name, Title

_____
Agency

The request will be placed in the folder containing the copy of the agreement, where it may be inspected by the parties or their authorized representatives.

This procedure will be applicable only to inspection or copying by the representatives of Government agencies, since no person other than a representative of a Government agency, or of a party, will be granted access to a copy of an interference settlement agreement which is kept separate from the interference file except by way of a petition for access thereto, see M.P.E.P. § 1002.02(k), item 2, and the parties to the interference are normally provided with copies of any such petition.

LUTRELLE F. PARKER,
Date: June 5, 1978. *Acting Commissioner of Patents and Trademarks.*

[972 OG 2]

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(84) ACCESSIBILITY OF NON-FINAL DISCOVERY OPINIONS AND ORDERS ISSUED BY THE BOARD OF PATENT INTERFERENCES

A number of inquiries have been received from the patent bar and other interested persons relating to discovery practice under 37 C.F.R. § 1.287 before the Board of Patent Interferences. The inquiries indicate a need for making available to the public non-final Board opinions, including concurring and dissenting opinions, as well as orders, made in the adjudication of discovery matters before the Board. While non-final opinions need not be made available to the public [5 U.S.C. § 552(a)(2)], in order to satisfy the need, copies of non-final opinions issued by the Board will be kept in a file in the Service Branch of the Board in the U.S. Patent and Trademark Office (Crystal Plaza, Building 6, Eleventh Floor, Room 1116, Arlington, Virginia). Opinions in the file may be reviewed by the public during normal business hours (8:30 A.M. to 5:00 P.M.). Copies of opinions may be made by the public on reproducing equipment in the Service Branch with tokens at a cost of $0.15 per page or copies may be ordered at a cost of $0.30 per page [37 C.F.R. 1.21(b)].

In view of the provisions of 35 U.S.C. § 122 and 37 C.F.R. § 1.11(a), a consent will be obtained by the Office from all parties in an interference before an opinion issued in connection with the interference is placed in the file if the interference file is not otherwise available to the public. Preliminary indications are that the parties and their counsel generally consent.

In order to obtain optimum dissemination of the information contained in the file, opinions placed therein will be indexed according to specific topics. Copies of the index will be updated from time to time as the need occurs. Specific questions relating to the index and file may be directed to the Patent Interference Examiners.

The initial index is as follows:

Index

1.00 Discovery in general [37 C.F.R. § 1.287]
- 1.10 Requests and service under § 1.287(a)
- 1.20 Requests under § 1.287(b)
- 1.30 Motions for additional discovery under § 1.287(c)
  - 1.31 Related to derivation
  - 1.32 Related to abandonment, suppression, and concealment
  - 1.33 Related to inequitable conduct
  - 1.34 Other
- 1.40 Motions under § 1.287(d)(1)
- 1.50 Action under § 1.287(d)(2)
- 1.60 Agreements under § 1.287(e)

C. MARSHALL DANN,
Mar. 5, 1976. *Commissioner of Patents and Trademarks.*

[944 O.G. 2098]

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(85) TITLE 37—PATENTS, TRADEMARKS AND COPYRIGHTS

CHAPTER I—PATENT AND TRADEMARK OFFICE, DEPARTMENT OF COMMERCE

PART 1—RULES OF PRACTICE IN PATENT CASES

PART 5—SECRECY OF INVENTIONS

Revised Patent Interference Rules

AGENCY: Patent and Trademark Office, Commerce.
ACTION: Final rule.

SUMMARY: These regulations prescribe certain requirements for patent interference proceedings which have not been specifically or clearly covered by existing provisions of the rules. The existing provision on public availability of interference files is clarified. A proposal made earlier to eliminate atachments to preliminary statements in interferences is not adopted.

EFFECTIVE DATE: August 1, 1978.

ADDRESS: Comments on the proposal are available for public inspection in Room 11E10, Crystal Plaza Building 3, 2021 Jefferson Davis Highway, Arlington, Virginia.

FOR FURTHER INFORMATION CONTACT: Ian A. Calvert, Chairman, Board of Patent Interferences, Patent and Trademark Office by telephone at (703) 557-3625, or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

SUPPLEMENTARY INFORMATION: INTERFERENCE PRACTICE. On November 30, 1976, notice of proposed rulemaking regarding the revision of sections 1.205, 1.207, 1.215, 1,216, 1.217, 1.222, 1.223, 1.225, 1.245, 1.247, 3.44, 3.45, and 5.3 of, and the addition of new section 1.246 to, Title 37 of the Code of Federal Regulations was published in the Federal Register (41 F.R. 52486). Interested persons were asked to comment and a period extending from the date of publication of the proposed rule changes to March 4, 1977 was allocated for such purpose. Eighteen comments were received. The comments are available for public inspection at the address given above.

In view of strong objection to the removal of requirements in sections 1.215, 1.216, 1.217, 1.222, 1.223, 3.44 and 3.45 for documents to be attached to preliminary statements, the proposed amendments to these rules are not being adopted. The consensus of the comments submitted was that the documents required by the present rules can be most useful in promoting an early settlement of interferences. A sentence is added to § 1.223(c) to incorporate into the rules the existing policy that the content of attachments to preliminary statements normally is not considered by the Office. *Reddy* v. *Davis*, 187 USPQ 386 (Commr. Pat. & Tm. 1975). The sentence that was proposed for § 1.217 relative to the signing of statements is adopted as a new last sentence in paragraph 1.217(1).

New paragraph 1.205(c) is being adopted with a change from the proposal. The paragraph as proposed provided for a notice to be placed in the file of a patent and sent to the patentee when claims are copied by an applicant from the patent. Three commenters suggested that a second notice should be placed in the patent file and sent to the patentee if a decision is made not to declare an interference. A sentence is being added to paragraph (c) to adopt this suggestion.

One of the commenters opposed paragraph 1.205(c) on the ground that the market value of a patent will be reduced if a notice is placed in the file that claims have been copied. It is believed that the provision for a second notice when an interference is not declared responds to this objection. One commenter suggested that the notice to the patentee under paragraph 1.205(c) should identify the party copying the patent claims or the attorney representing that party. This suggestion is outside the scope of the proposal and is not adopted. The amendment that was proposed to section 5.3 is adopted in order to provide a cross-reference to new paragraph 1.205(c).

No adverse comments were received relative to the proposed revisions of sections 1.207, 1.225, 1.245, and 1.247, and the addition of new section 1.246. These proposals are being adopted. Section 1.225 is divided into paragraphs and the order of the sentences is changed from the proposal for clarity. Section 1.287(c) is amended to refer to new section 1.246 instead of section 1.245. With regard to the revision of section 1.247(b), the word "expected" is corrected to read "excepted."

TEXT OF RULES ADOPTED

The second sentence of paragraph 1.11(a) is being amended to make clear that the file of an interference involving an issued patent is open to the public if the interference is terminated without an award of priority by the Board of Patent Interferences, as well as being open when there is an award of priority. The amendment adds the phrase "or after termination if no such award is made" in the second sentence. The language that was used in paragraph 1.11(a) prior to March 1, 1977 was clear on this point. The second sentence of paragraph 1.11(a) was broadened effective March 1, 1977 (42 F.R. 5593, 955 O.G. 1054), however, to make interference files available to the public at an earlier date. In making this change the rule inadvertently was worded so that it is susceptible to the interpretation that the file of an interference is not open to the public if the interference is terminated without an award of priority. The published record shows that the Patent and Trademark Office did not intend this meaning. The Office has continued to grant public access to such files since the March 1977 amendment.

Since the change in paragraph 1.11(a) merely clarifies the rule and is consistent with existing policy, notice and public procedure prior to adoption of the change are deemed unnecessary.

FILES OPEN TO PUBLIC

As announced in the notice published in the Federal Register of November 20, 1976 (41 F.R. 52486) the Patent and Trademark Office determined that these rules do not contain a major proposal requiring preparation of an Economic Impact Statement under Executive Orders 11821 and 11949 which were in effect at that time.

In consideration of the comments received and pursuant to the authority contained in § 6 of Title 35 of the United States Code, Parts 1 and 5 of Title 37 of the Code of Federal Regulations are hereby amended as set forth below. • • •

• • • • •

[In the text set forth below, changes from the existing rules are shown by arrows and brackets, additions being indicated by arrows and deletions by brackets.]

LUTRELLE F. PARKER,
Acting Commissioner of Patents.

Date: 6-5-78.

Approved: June 20, 1978.

JORDAN J. BARUCH,
Assistant Secretary for Science and Technology.

1. In § 1.11 paragraph (a) is revised to read:

§ 1.11 *Files open to the public.*

(a) After a patent has been issued, the specification, drawings, and all papers relating to the case in the file of the patent are open to inspection by the general public, and copies may be obtained upon paying the fee therefor. After an award of priority by the Board of Patent Interferences as to all parties, ►or after termination if no such award is made,◄ the file of any interference which involved a patent, or an application on which a patent has issued, is similarly open to public inspection and procurement of copies. See § 2.27 for trademark files.

• • • • •

2. In § 1.205 a new paragraph (c) is added to read:

§ 1.205 *Interference with a patent; copying claims from patent.*

• • • • •

►(c) A notice that one or more claims of a patent have been copied or substantially copied by an applicant will be placed in the file of the patent, and a copy of said notice will be sent to the patentee. However, the identify of the applicant will not be disclosed to the patentee unless an interference is declared. If a final decision is made not to declare an interference, a notice to that effect will also be placed in the file of the patent and sent to the patentee.◄

3. In § 1.207 paragraph (b) is revised to read:

§ 1.207 *Preparation of interference papers and declaration of interference.*

• • • • • •

(b) A patent interference examiner will institute and declare the interference by forwarding notices to the several parties to the proceeding. Each notice shall include the name and residence of each of the other parties and those of his attorney or agent, and of any assignee, and will identify the application of each opposing party by serial number and filing date, or in the case of a patentee by the number and date of the patent. The notices shall also specify the issue of the interference, which shall be clearly and concisely defined in only as many counts as may be necessary to define the interfering subject matter (but in the case of an interference with a patent all the claims of the patent which can be made by the applicant should constitute the counts), and shall indicate the claim or claims of the respective cases corresponding to the count or counts. [If the application or patent of a party included in the interference is a division, continuation or continuation-in-part of a prior application and the examiner has determined that it is entitled to the filing date of such prior application, the notices shall so state.] ►If the primary examiner has indicated that the patent or application of any party included in the interference is entitled to the benefit of the filing date of any prior applications as to the subject matter in issue, the notices shall so state and shall specify such prior applications.◄ Except as noted in paragraph (e) of this section, the notices shall also set a schedule of times for taking various actions as follows:

(1) For filing the preliminary statements required by § 1.215 and serving notice of such filing, not less than 2 months from the date of declaration.

(2) For each party who files a preliminary statement to serve a copy thereof on each opposing party who also files a preliminary statement as required by § 1.215(b), not less than 15 days after the expiration of the time for filing preliminary statements.

(3) For filing motions under § 1.231, not less than 4 months from declaration.

4. Section 1.217 is revised to read:

§ 1.217 *Contents of the preliminary statement; invention made abroad.*

[(a)] When the invention was made abroad the facts specified by § 1.216(a) (1) to (6) are not required, and in lieu thereof there shall be stated:

(1) When the invention was introduced into this country by or on behalf of the party, giving the circumstances with the dates connected therewith which are relied upon to establish the fact and, when appropriate, including allegations of activity in this country of the nature of that represented by § 1.216(a) (1) to (6) and documentary attachments if the allegations relate to a drawing or written description. ►Such statement may be signed or sworn to, or made in the form of a declaration, either by the inventor or by one authorized to make the statement and having knowledge of the facts alleged therein.◄

(2) If a party is entitled to the benefit of the second sentence of 35 U.S.C. 104, he must so state and his preliminary statement must include allegations of activity abroad corresponding to those required by § 1.216(a) (1) to (6).

5. In § 1.223 paragraph (c) is revised to read:

§ 1.223 *Effect of Statement.*

* * * * *

(c) If a party to an interference fails to file a statement, testimony will not be received subsequently from him to prove that he made the invention at a date prior to his effective filing date. If a party alleges in his statement a date of first drawing or first written description but does not attach a copy of such drawing or written description as required by § 1.216(b), he will be restricted to his effective filing date as to that allegation unless such copy is admitted by motion under § 1.222. ►The content of a drawing or written description attached to the statement normally will not be considered by the Office.◄

* * * * *

6. Section 1.225 is revised to read :

§ 1.225 *Failure of junior party to file statements or to overcome filing date of senior party.*

►(a)◄ If a junior party to an interference fails to file a preliminary statement, or if his statement fails to overcome the effective filing date of the application of another party, judgment on the record will be entered against such junior party unless he has filed a proper motion under § 1.231, within the time set for such motions, seeking some action in the interference. If such motion has been timely filed but does not result in action in the interference which removes the basis for a judgment on the record, such judgment will be entered unless the motion related to a matter which may be reviewed at final hearing under § 1.258, and within 30 days of the decision denying his motion, or a later time set by the patent interference examiner, the junior party concerned requests that final hearing be set to review such matter. Also, such a junior party may within such 30 day period, or time set, request a final hearing to review such a matter raised by his opposition to a motion under § 1.231(a)(2), (3), (4), or (5) which was granted over his opposition.

►(b)◄ Such a junior party will not be permitted to take testimony except on granting of a motion accompanied by a showing of good cause, which should normally include names of proposed witnesses and affidavits or declarations by them giving their expected testimony.

►(c) If, as a result of a decision on motion, the original senior party is deprived of the benefit of an earlier filed application and is thereby made a junior party and if in addition he relies solely on said earlier filed application in his preliminary statement, he stands in the same position as a junior party whose statement fails to overcome the effective filing date of the senior party as in the first sentence of § 1.225(a).◄

7. Section 1.245 is revised to read :

§ 1.245 *Extension of time.*

Extensions of time in any case not otherwise provided for may be had by stipulation of the parties, subject to approval, or on motion duly brought, sufficient cause being shown for such extension. [A motion not timely made may be considered upon a showing of sufficient cause as to why such motion was not timely presented.]

8. A new § 1.246 is added to read :

►§ 1.246 *Late papers.*

A motion or other paper belatedly filed will not normally be considered except upon a showing, under oath or in the form of a declaration (§ 1.68), of sufficient cause as to why such motion or paper was not timely presented.◄

9. Section 1.247 is revied to read.

§ 1.247 *Service of papers.*

►(a)◄ Every paper filed in the Patent and Trademark Office in interference proceeding must be served upon the other parties in the manner provided in § 1.248, except the following :

[(a)] ►(1)◄ Preliminary statements at the time of filing but see § 1.215(b) and (c) [.] ►.◄

[(b)] ►(2)◄ Documentary exhibits introduced at the taking of a deposition.

[(c)] ►(3)◄ Certified transcripts of testimony under § 1.276 (but copies of the record must be served [(§ 1.253a)].] ►(§ 1.253(a)).◄

[(d)] ◄(4)◄ Statutory [declaimers] ►disclaimers◄ under 35 U.S.C. 253.

►(b)◄ The specification in certain sections that a designated paper must be served does not imply that other papers, not [expected] ►excepted◄ above need not be served. However, the requirement for service of designated papers may be waived under particular circumstances and service may be required of other designated papers which need not ordinarily be served. Proof of [such] service must be made before the paper will be considered in the interference by the Office. A statement of the attorney, attached to or appearing in the original paper when filed, clearly stating the time and manner in which service was made will be accepted as [prima facie] ►*prima facie*◄ proof of service.

10. In § 1.287, paragraph (c), first sentence, "§ 1.245" is changed to "§ 1.246."

11. In § 5.3, paragraph (b), at the end of the paragraph, "See § 1.205(c)." is added.

[978 OG 19]

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(86) EXTENSIONS OF TIME AND FILING OF PAPERS IN INTERFERENCES

A recent sample of the interferences declared during fiscal years 1971–1975 has shown that since the 1950–1959 period there has been an increase of 27 days in the approximately one and one-half year pendency time of the average interference. This increase has occurred in spite of the Commissioner's notice of April 24, 1964, 802 O.G. 601, and an extensive revision of the interference rules in 1965.

While the failure to achieve any reduction in average interference pendency time may in part be attributable to the adoption in 1971 of 37 CFR 1.287(a)(2), which provides for the setting of additional time periods for purposes of discovery, it appears that a considerable reduction would result if the parties were to adhere to the times originally set by the Office, rather than seeking extensions of those times. Accordingly, stipulations or motions for extensions of time under 37 CFR 1.245 will not henceforth be approved or granted, respectively, unless accompanied by a detailed showing of facts sufficient to establish that the action for which the extension is sought could not have been or cannot be taken or completed during the time previously set therefor, and that the entire extension appears necessary for the taking or completion of that action. Since the Office favors the amicable settlement of interferences, the foregoing requirement will be liberally applied in the case of a first request for extension of time for the purpose of negotiating settlement.

Another factor which adversely affects the pendency time of the average interference is the number of papers filed. While parties are certainly entitled to exercise their rights in filing papers provided for by the rules, many papers are also filed that are not provided for by the rules, such as replies to replies to oppositions to motions under 37 CFR 1.231, and replies to oppositions to motions or petitions under 37 CFR 1.243 or 1.244. These unprovided-for papers appear to be generally unnecessary, cause a considerable increase in the size of the interference files, and delay determination of the motions or petitions to which they relate. Therefore, in the future papers filed in interference proceedings will be given no consideration unless they are specifically provided for by the rules. In this regard, particular attention is directed to 37 CFR 1.228, 1.231(b), 1.237, 1.243 and 1.244.

C. MARSHALL DANN,
Nov. 9, 1976. *Commissioner of Patents and Trademarks.*

[953 OG 2]

MISCELLANEOUS

(87) DISCLOSURE DOCUMENT PROGRAM

This notice consolidates and supersedes the notices of Mar. 26, 1969 (862 O.G. 1) and Aug. 11, 1970 (878 O.G. 1) relating to the Patent Office Disclosure Document Program.

Under this program the Patent Office accepts and preserves, for a period of two years, papers referred to as "Disclosure Documents." These papers may be used as evidence of the dates of conception of inventions.

THE PROGRAM

A paper disclosing an invention and signed by the inventor or inventors may be forwarded to the Patent Office by the

inventor (or by any one of the inventors when there are joint inventors), by the owner of the invention, or by the attorney or agent of the inventor(s) or owner. It will be retained for two years and then be destroyed unless it is referred to in a separate letter in a related patent application within said two years.

A Disclosure Document is not a patent application and the date of its receipt in the Patent Office will not become the effective filing date of any patent application subsequently filed. However, like patent applications, these documents will be kept in confidence by the Patent Office. If patent protection is desired, a patent application should be filed as soon as possible.

This program does not diminish the value of conventional witnessed and notarized records as evidence of conception of an invention, but it should provide a more credible form of evidence than that provided by the popular practice of mailing a disclosure to oneself or another person by registered mail. The program is made available as a service to those persons desiring to use it.

CONTENT OF DISCLOSURE DOCUMENT

Although there are no restrictions as to content and claims are not necessary, the benefits afforded by a Disclosure Document will depend directly upon the adequacy of the disclosure. Therefore, it is strongly urged that the document contain a clear and complete explanation of the manner and process of making and using the invention in sufficient detail to enable a person having ordinary knowledge in the field of the invention to make and use the invention. When the nature of the invention permits, a drawing or sketch should be included. The use or utility of the invention should be described, especially in chemical inventions.

The Disclosure Document must be limited to written matter or drawings on paper or other thin, flexible material, such as linen or plastic drafting material, having dimensions or being folded to dimensions not to exceed 8½ by 13 inches. Photographs also are acceptable. Each page should be numbered. Text and drawings should be sufficiently dark to permit reproduction with commonly used office copying machines.

A $10 fee is charged for filing a Disclosure Document. Payment must accompany the Disclosure Document when it is submitted to the Patent Office.

In addition to the $10 fee, the Disclosure Document must be accompanied by a stamped, self-addressed envelope and a separate paper in duplicate, signed by the inventor, stating that he is the inventor and requesting that the material be received for processing under the Disclosure Document Program. The papers will be stamped by the Patent Office with an identifying number and date of receipt, and the duplicate request will be returned in the self-addressed envelope together with a warning notice indicating that the Disclosure Document may be relied upon only as evidence and that a patent application should be diligently filed if patent protection is desired. The inventor's request may take the following form:

"The undersigned, being the inventor of the disclosed invention, requests that the enclosed papers be accepted under the Disclosure Document Program, and that they be preserved for a period of two years."

RETENTION

The Disclosure Document will be preserved in the Patent Office for two years after its receipt and will then be destroyed unless it is referred to in a separate letter in a related patent application filed within the two-year period. The Disclosure Document must be referred to in the separate letter by title, number, and date of receipt. Acknowledgment of receipt of such letters will be made in the next official communication or in separate letter from the Patent Office. Unless it is desired to have the Patent Office retain the Disclosure Document beyond the two-year period, it is not required that it be referred to in a patent application.

WARNING AS TO LIMITATIONS

The two-year retention period should not be considered to be a "grace period" during which the inventor can wait to file his patent application without possible loss of benefits. It should be recognized that in establishing priority of invention an affidavit or testimony referring to a Disclosure Document must usually also establish diligence in completing the invention or in filing the patent application since the filing of the Disclosure Document.

Inventors are also reminded that any public use or sale in the United States, or publication of the invention anywhere in the world, more than one year prior to the filing of a patent application on that invention will prohibit the granting of a patent on that invention.

If the inventor is not familiar with what is considered to be "diligence in completing the invention" or "reduction to practice" under the patent law, or if he has other questions about patent matters, the Patent Office advises him to consult an attorney or agent registered to practice before the Patent Office. Patent attorneys and agents may be found in the telephone directories of most major cities. Also, many large cities have associations of patent attorneys which may be consulted.

RICHARD A. WAHL,
Jan. 4, 1971. *Assistant Commissioner of Patents.*

[883 O.G. 3]

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(88) SUSPENSION OF ACTION UNDER 37 CFR 1.103 AND UNDER 37 CFR 1.212

The purpose of this notice is to clarify existing Office practice with respect to suspension of action.

"Suspension of action" under 37 CFR 1.103 applies only to the situation where action is to be taken *by the Examiner*. In other words, action cannot be suspended in an application which contains an outstanding Office action awaiting response by the applicant.

Under 37 CFR 1.212, upon declaration of an interference, ex parte prosecution of an application is suspended and any outstanding Office actions are considered as withdrawn by operation of the rule. *Ex parte Peterson*, 49 USPQ 119 (Commissioner of Patents, 1941). Upon termination of the interference, the Examiner will reinstate the action treated as withdrawn by operation of 37 CFR 1.212 and set a statutory period for response. The formats set forth in MPEP 1109.01 and MPEP 1109.02 may be followed.

Careful adherence to the distinction set forth above will prevent any question of abandonment from arising in connection with cases in which suspension of prosecution has occurred.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

Mar. 7, 1978.

[969 OG 8]

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(89) POSTAL SERVICE EMERGENCY CONTINGENCY PLAN

The U.S. Patent and Trademark Office is establishing the following contingency plan for filing any paper or paying any fee in the Office in the event of an emergency caused by any major interruption in the mail service in the United States. Upon determination by the Commissioner of Patents and Trademarks that such an emergency exists, a notice activating the plan will be issued by the Commissioner. The activating notice will be published in the Wall Street Journal and made available in a special recorded telephone message at area code 703, 557-3158. Also, certain publications, patent bar groups, and other organizations closely associated with the patent system, will be notified. Termination of the program will be similarly announced. Where the postal emergency is not nationwide, the Commissioner will designate the areas of the United States in which the procedures outlined below will be in effect.

U.S. Department of Commerce District Offices (formerly referred to as Department of Commerce Field Offices) will be designated on an emergency basis, as receiving stations for filing papers and paying fees in the U.S. Patent and Trademark Office.

Upon determination that an emergency exists, the following procedures may be followed: All papers and fees should be enclosed in a sealed envelope addressed to the Patent and Trademark Office and deposited in one of the District Offices. Such papers will be considered as received in the U.S. Patent

and Trademark Office on the day of deposit. The District Office will date stamp each envelope and the accompanying receipt card which completely identifies the deposited papers. The receipt card will be returned to the depositor. Applicants or their representatives should assure the legibility of the date stamp.

District Office deposits should be limited to checks in payment of issue fees, new application papers wherein priority dates or statutory bars may be involved, amendments where the six month statutory period for response is about to expire, trademark oppositions, Section 8 affidavits, trademark renewals, and to other papers for which the patent and trademark statutes do not provide a remedy for failure to obtain a particular date.

Where papers originate from overseas, it is suggested that the papers be mailed to a registered agent in Canada, with a request that the papers be forwarded by courier to the nearest District Office in the United States.

In regard to pending applications, if the time for taking any action or paying any fee expires during the period that the Commissioner declares to be an emergency, the time will be extended until one month after the end of the emergency period, provided that such extension does not exceed the maximum period for response provided for in the statutes.

Since this extension of time will be automatic, there will be no record in the individual files to indicate that a response filed during the extended period is in fact timely. In order to provide a complete record, applicants or their representatives should file a paper referring to this notice in each case in which a response is filed during the extended period.

The addresses of the Department of Commerce District Offices, subject to subsequent changes, are as follows:

ALBUQUERQUE, N.M., 87101, Room 316, U.S. Courthouse (505) 766–2386.

ANCHORAGE, 99501, 632 Sixth Ave., Hill Bldg., Suite 412 (907) 265–4597.

ATLANTA, 30309, Suite 523, 1401 Peachtree St., NE. (404) 526–6000.

BALTIMORE, 21202, 415 U.S. Customhouse, Gay and Lombard Sts. (301) 962–3560.

BIRMINGHAM, ALA., 35205, Suite 200–201, 908 S. 20th St. (205) 325–3327.

BOSTON, 02116, 10th Floor, 441 Stuart St. (617) 223–2312.

BUFFALO, N.Y., 14202, Room 1312, Federal Bldg., 111 W. Huron St. (716) 842–3208.

CHARLESTON, W. VA., 25301, 3000 New Federal Office Bldg., 500 Quarrier St. (304) 343–6181, Ext. 375.

CHEYENNE, WYO., 82001, 6022 O'Mahoney Federal Center, 2120 Capitol Ave. (307) 778–2151.

CHICAGO, 60603, Room 1406, Mid-Continental Plaza Bldg., 55 E. Monroe St. (312) 353–4450.

CINCINNATI, 45202, 8028 Federal Office Bldg., 550 Main St. (513) 684–2944.

CLEVELAND, 44114, Room 600, 666 Euclid Ave. (216) 522–4750.

COLUMBIA, S.C., 29204, Forest Center, 2611 Forest Dr. (803) 765–5345.

DALLAS, 75202, Room 3E7, 1100 Commerce St. (214) 749–1515.

DENVER, 80202, Room 161, New Custom House, 19th and Stout Sts. (303) 837–3246.

DES MOINES, IOWA, 50309, 609 Federal Bldg., 210 Walnut St. (515) 284–4222.

DETROIT, 48226, 445 Federal Bldg. (313) 226–3650.

GREENSBORO, N.C., 27402, 203 Federal Bldg., W. Market St., P.O. Box 1950. (919) 275–9111, Ext. 345.

HARTFORD, CONN. 06103, Room 610–B, Federal Office Bldg., 450 Main St. (203) 244–3530.

HONOLULU, 96813, 286 Alexander Young Bldg., 1015 Bishop St. (808) 546–8694.

HOUSTON, 77002, 201 Fannin, 1017 Federal Office Bldg. (713) 226–4231.

INDIANAPOLIS, 46204, 355 Federal Office Bldg., 46 E. Ohio St. (317) 269–6214.

KANSAS CITY, MO., 64106, Room 1840, 601 E. 12th St. (816) 374–3142.

LOS ANGELES, 90024, 11201 Federal Bldg., 11000 Wilshire Blvd. (213) 824–7591.

MEMPHIS, 38103, Room 710, 147 Jefferson Ave. (901) 534–3213.

MIAMI, 33130, Rm. 821, City National Bank Bldg., 25 W. Flagler St. (305) 350–5267.

MILWAUKEE, 53203, Straus Bldg., 238 W. Wisconsin Ave. (414) 224–3473.

MINNEAPOLIS, 55401, 306 Federal Bldg., 110 S. Fourth St. (612) 725–2133.

NEW ORLEANS, 70130, Room 432, International Trade Mart, 2 Canal St. (504) 589–6546.

NEW YORK, 10007, 41st Floor, Federal Office Bldg., 26 Federal Plaza, Foley Sq. (212) 264–0634.

NEWARK, N.J., 07102, Gateway Bldg., (4th floor) (201) 645–6214.

PHILADELPHIA, 19106, 9448 Federal Bldg., 600 Arch St. (215) 597–2850.

PHOENIX, ARIZ., 85004, 508 Greater Arizona Savings Bldg., 112 N. Central Ave. (602) 261–3285.

PITTSBURGH, 15222, 431 Federal Bldg., 1000 Liberty Ave. (412) 644–2850.

PORTLAND, ORE., 97205, 921 SW. Washington St., Suite 521, Pittock Block. (503) 221–3001.

RENO, NEV., 89502, 2028 Federal Bldg., 300 Booth St. (702) 784–5203.

RICHMOND, VA., 23240, 8010 Federal Bldg., 400 N. 8th St. (804) 782–2246.

ST. LOUIS, 63105, Chromalloy Bldg., 120 S. Central Ave. (314) 622–4243.

SALT LAKE CITY, 84111, 1201 Federal Bldg., 125 S. State St. (801) 524–5116.

SAN FRANCISCO, 94102, Federal Bldg., Box 36013, 450 Golden Gate Ave., (415) 556–5860.

SAN JUAN, P.R., 00902, Room 100, Post Office Bldg. (809) 723–4640.

SAVANNAH, 31402, 235 U.S. Courthouse and Post Office Bldg., 125–29 Bull St. (912) 232–4204.

SEATTLE, 98109, 706 Lake Union Bldg., 1700 Westlake Ave. North (206) 442–5615.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

July 18, 1975.

[937 O.G. 386]

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(90)

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patent may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries—Continued

of service to the public, anyone contemplating use of the library, in advance, about its collection and hours, so as patents at a particular library is advised to contact that to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626-7555 Ext. 274
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

[974 OG 11]

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(91) EXAMINER TESTIMONY

As stated in Section 1701 of the Manual of Patent Examining Procedure, patent examiners are forbidden to testify as patent experts or to express opinions, in testimony or otherwise, as to the invalidity of any issued patent. Patent examiners have, in connection with litigation involving patent validity, been called to testify on factual matters. In those cases, the practice has been to permit the examiner to testify only upon the issuance of a subpoena.

Henceforth, patent examiners will be permitted to testify on deposition in patent suits, without the need for a subpoena, provided the following conditions are satisfied:

1. The party proposing to take the testimony will state in writing, that the questions to be asked of the examiner will be phrased to comply with the permissible scope of inquiry as outlined in the protective orders contained in the Court opinions in *In re Mayewsky*, 162 USPQ 86, 89 and *Shaffer Tool Works* v. *Joy Manufacturing Co.*, 167 USPQ 170, 171: " . . . the scope of the oral depositions of the patent examiners is hereby limited to matters of fact and must not go into hypothetical or speculative areas or the bases, reasons, mental processes, analyses, or conclusions of the patent examiners in acting upon the patent applications maturing into the patent [in suit]." 167 USPQ 171.
2. That in addition to complying with the requirements of Rule 30 of the Federal Rules of Civil Procedure, the party taking the testimony will agree to give notice of the taking of the deposition of the patent examiner to the Solicitor, at least thirty days prior to the date on which the taking of the deposition is desired.
3. That the party taking the deposition arrange with the Solicitor to notice the deposition at a place convenient to the Patent Office.

If the party desiring to take the testimony of the examiner does not agree to the conditions enumerated, the Patent Office will not permit the examiner to be deposed without a subpoena and compliance with the procedure set forth in Section 7.02, Department of Commerce Administrative Order 205–12, June 29, 1967 as amended April 10, 1970. That section states:

> In any case where it is sought by subpoena, order or other compulsory process or other demand of a court or other authority (hereinafter referred to as a "demand") to require the production or disclosure of any record in the files of the Department of Commerce or other information acquired by an officer or employee of the Department as a part of the performance of his official duties or because of his official status, the matter shall be immediately referred for determination to the appropriate official described in subsection 4.01 of this order. If such official has discretion with respect to disclosure and he determines that it would be improper to comply with the demand, or if he has no discretion with respect to disclosure, the matter shall be promptly referred to the Secretary of Commerce for final determination. Unless and until the Secretary determines that the records or information should be produced, the officer or employee who appears in answer to the demand shall inform the court or other authority (*a*) that the section 7 of this order prohibits the officer or employee from producing or disclosing the records or other information demanded without the prior approval of the Secretary of Commerce, and (*b*) that the demand has been, or is being, as the case may be, referred for the prompt consideration of the Secretary. The officer or employee shall also provide the court or other authority with a copy of the regulations prescribed in this section 7 of this order, and shall respectfully request the court or other authority to stay the demand pending the receipt of instructions or directions from the Secretary of Commerce concerning the demand.

ROBERT GOTTSCHALK,
Commissioner of Patents.

Mar. 13, 1972.

[897 O.G. 762]

PATENT COOPERATION TREATY

(92) PATENT COOPERATION TREATY: IMPLEMENTING LEGISLATION AND RATIFICATION

Public Law 94-131, as reprinted below, implements the Patent Cooperation Treaty (see Official Gazette, Volume 876, page 341; July 14, 1970) which was signed by the United States and 34 other countries in 1970. After enactment of the implementing legislation on November 14, 1975, the United States ratified the Treaty on November 26, 1975, thereby becoming the first country with major patent activity to do so. In accordance with the provisions of Article 63 of the Treaty, it enters into force three months after eight countries have adhered to it, four of which must have certain defined major patent activity.

Up to the time of United States ratification eight countries with only minor patent activity had adhered to the Treaty. Ratification by the United States, therefore, represents a significant step in the direction of bringing the Treaty into force. Other countries with major patent activity, and especially European countries, have been awaiting United States ratification before adhering themselves. Consequently, it is hoped that United States commitment to the Treaty has been demonstrated and will encourage adherence by other countries with major patent activity, thereby bringing into force a Treaty which would offer many advantages and benefits to patent applicants and patent offices alike. Because of the necessary action of other countries in bringing the Treaty into force, no exact date can be given at this time. It is presently estimated, however, that at least the necessary number of countries would be reached in Fiscal Year 1977.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Date: Dec. 11, 1975.

Public Law 94-131
94th Congress, S. 24
November 14, 1975

An Act

To carry into effect certain provisions of the Patent Cooperation Treaty, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That title 35, United States Code, entitled "Patents", be amended by adding at the end thereof a new part IV to read as follows:

Patent Cooperation Treaty.

"PART IV.—PATENT COOPERATION TREATY

"Chapter 35.—DEFINITIONS

"Sec.
"351. Definitions.

"§ 351. Definitions 35 USC 351.

"When used in this part unless the context otherwise indicates—

"(a) The term 'treaty' means the Patent Cooperation Treaty done at Washington, on June 19, 1970, excluding chapter II thereof.

"(b) The term 'Regulations', when capitalized, means the Regulations under the treaty excluding part C thereof, done at Washington on the same date as the treaty. The term 'regulations', when not capitalized, means the regulations established by the Commissioner under this title.

"(c) The term 'international application' means an application filed under the treaty.

"(d) The term 'international application originating in the United States' means an international application filed in the Patent Office when it is acting as a Receiving Office under the treaty, irrespective of whether or not the United States has been designated in that international application.

"(e) The term 'international application designating the United States' means an international application specifying the United States as a country in which a patent is sought, regardless where such international application is filed.

"(f) The term 'Receiving Office' means a national patent office or intergovernmental organization which receives and processes international applications as prescribed by the treaty and the Regulations.

"(g) The term 'International Searching Authority' means a national patent office or intergovernmental organization as appointed under the treaty which processes international applications as prescribed by the treaty and the Regulations.

"(h) The term 'International Bureau' means the international intergovernmental organization which is recognized as the coordinating body under the treaty and the Regulations.

"(i) Terms and expressions not defined in this part are to be taken in the sense indicated by the treaty and the Regulations.

"Chapter 36.—INTERNATIONAL STAGE

"Sec.
"361. Receiving Office.
"362. International Searching Authority.
"363. International application designating the United States: Effect.
"364. International stage: Procedure.
"365. Right of priority; benefit of the filing date of a prior application.
"366. Withdrawn international application.
"367. Actions of other authorities: Review.
"368. Secrecy of certain inventions; filing international applications in foreign countries.

35 USC 361. **"§ 361. Receiving Office**

"(a) The Patent Office shall act as a Receiving Office for international applications filed by nationals or residents of the United States. In accordance with any agreement made between the United States and another country, the Patent Office may also act as a Receiving Office for international applications filed by residents or nationals of such country who are entitled to file international applications.

"(b) The Patent Office shall perform all acts connected with the discharge of duties required of a Receiving Office, including the collection of international fees and their transmittal to the International Bureau.

"(c) International applications filed in the Patent Office shall be in the English language.

"(d) The basic fee portion of the international fee, and the transmittal and search fees prescribed under section 376(a) of this part, shall be paid on filing of an international application. Payment of designation fees may be made on filing and shall be made not later than one year from the priority date of the international application.

Post, p. 690.

35 USC 362. **"§ 362. International Searching Authority**

"The Patent Office may act as an International Searching Authority with respect to international applications in accordance with the terms and conditions of an agreement which may be concluded with the International Bureau.

35 USC 363. **"§ 363. International application designating the United States: Effect**

"An international application designating the United States shall have the effect, from its international filing date under article 11 of the treaty, of a national application for patent regularly filed in the Patent Office except as otherwise provided in section 102(e) of this title.

Post, p. 691.

35 USC 364. **"§ 364. International stage: Procedure**

"(a) International applications shall be processed by the Patent Office when acting as a Receiving Office or International Searching Authority, or both, in accordance with the applicable provisions of the treaty, the Regulations, and this title.

"(b) An applicant's failure to act within prescribed time limits in connection with requirements pertaining to a pending international application may be excused upon a showing satisfactory to the Commissioner of unavoidable delay, to the extent not precluded by the treaty and the Regulations, and provided the conditions imposed by the treaty and the Regulations regarding the excuse of such failure to act are complied with.

35 USC 365. **"§ 365. Right of priority; benefit of the filing date of a prior application**

"(a) In accordance with the conditions and requirements of section 119 of this title, a national application shall be entitled to the right of

35 USC 119.

priority based on a prior filed international application which designated at least one country other than the United States.

"(b) In accordance with the conditions and requirement of the first paragraph of section 119 of this title and the treaty and the Regulations, an international application designating the United States shall be entitled to the right of priority based on a prior foreign application, or a prior international application designating at least one country other than the United States. 35 USC 119.

"(c) In accordance with the conditions and requirements of section 120 of this title, an international application designating the United States shall be entitled to the benefit of the filing date of a prior national application or a prior international application designating the United States, and a national application shall be entitled to the benefit of the filing date of a prior international application designating the United States. If any claim for the benefit of an earlier filing date is based on a prior international application which designated but did not originate in the United States, the Commissioner may require the filing in the Patent Office of a certified copy of such application together with a translation thereof into the English language, if it was filed in another language. Post, p. 692.

"§ 366. Withdrawn international application 35 USC 366.

"Subject to section 367 of this part, if an international application designating the United States is withdrawn or considered withdrawn, either generally or as to the United States, under the conditions of the treaty and the Regulations, before the applicant has complied with the applicable requirements prescribed by section 371(c) of this part, the designation of the United States shall have no effect and shall be considered as not having been made. However, such international application may serve as the basis for a claim of priority under section 365 (a) and (b) of this part, if it designated a country other than the United States. Infra.

"§ 367. Actions of other authorities: Review 35 USC 367.

"(a) Where a Receiving Office other than the Patent Office has refused to accord an international filing date to an international application designating the United States or where it has held such application to be withdrawn either generally or as to the United States, the applicant may request review of the matter by the Commissioner, on compliance with the requirements of and within the time limits specified by the treaty and the Regulations. Such review may result in a determination that such application be considered as pending in the national stage.

"(b) The review under subsection (a) of this section, subject to the same requirements and conditions, may also be requested in those instances where an international application designating the United States is considered withdrawn due to a finding by the International Bureau under article 12(3) of the treaty.

"§ 368. Secrecy of certain inventions; filing international applications in foreign countries 35 USC 368.

"(a) International applications filed in the Patent Office shall be subject to the provisions of chapter 17 of this title. 35 USC 181 et seq.

"(b) In accordance with article 27(8) of the treaty, the filing of an international application in a country other than the United States on the invention made in this country shall be considered to constitute the filing of an application in a foreign country within the meaning of chapter 17 of this title, whether or not the United States is designated in that international application.

"(c) If a license to file in a foreign country is refused or if an international application is ordered to be kept secret and a permit refused, the Patent Office when acting as a Receiving Office or International Searching Authority, or both, may not disclose the contents of such application to anyone not authorized to receive such disclosure.

"Chapter 37.—NATIONAL STAGE

"Sec.
"371. National stage: Commencement.
"372. National stage: Requirements and procedure.
"373. Improper applicant.
"374. Publication of international application: Effect.
"375. Patent issued on international application: Effect.
"376. Fees.

35 USC 371.

"§ 371. National stage: Commencement

"(a) Receipt from the International Bureau of copies of international applications with amendments to the claims, if any, and international search reports is required in the case of all international applications designating the United States, except those filed in the Patent Office.

"(b) Subject to subsection (f) of this section, the national stage shall commence with the expiration of the applicable time limit under article 22 (1) or (2) of the treaty, at which time the applicant shall have complied with the applicable requirements specified in subsection (c) of this section.

"(c) The applicant shall file in the Patent Office—

"(1) the national fee prescribed under section 376(a) (4) of this part;

"(2) a copy of the international application, unless not required under subsection (a) of this section or already received from the International Bureau, and a verified translation into the English language of the international application, if it was filed in another language;

"(3) amendments, if any, to the claims in the international application, made under article 19 of the treaty, unless such amendments have been communicated to the Patent Office by the International Bureau, and a translation into the English language if such amendments were made in another language;

35 USC 111 et seq. 35 USC 115.

"(4) an oath or declaration of the inventor (or other person authorized under chapter 11 of this title) complying with the requirements of section 115 of this title and with regulations prescribed for oaths or declarations of applicants.

"(d) Failure to comply with any of the requirements of subsection (c) of this section, within the time limit provided by article 22 (1) or (2) of the treaty shall result in abandonment of the international application.

"(e) After an international application has entered the national stage, no patent may be granted or refused thereon before the expiration of the applicable time limit under article 28 of the treaty, except with the express consent of the applicant. The applicant may present amendments to the specification, claims, and drawings of the application after the national stage has commenced.

"(f) At the express request of the applicant, the national stage of processing may be commenced at any time at which the application is in order for such purpose and the applicable requirements of subsection (c) of this section have been complied with.

"§ 372. National stage: Requirements and procedure 35 USC 372.

"(a) All questions of substance and, within the scope of the requirements of the treaty and Regulations, procedure in an international application designating the United States shall be determined as in the case of national applications regularly filed in the Patent Office.

"(b) In case of international applications designating but not originating in, the United States—

"(1) the Commissioner may cause to be reexamined questions relating to form and contents of the application in accordance with the requirements of the treaty and the Regulations;

"(2) the Commissioner may cause the question of unity of invention to be reexamined under section 121 of this title, within the scope of the requirements of the treaty and the Regulations. 35 USC 121.

"(c) Any claim not searched in the international stage in view of a holding, found to be justified by the Commissioner upon review, that the international application did not comply with the requirement for unity of invention under the treaty and the Regulations, shall be considered canceled, unless payment of a special fee is made by the applicant. Such special fee shall be paid with respect to each claim not searched in the international stage and shall be submitted not later than one month after a notice was sent to the applicant informing him that the said holding was deemed to be justified. The payment of the special fee shall not prevent the Commissioner from requiring that the international application be restricted to one of the inventions claimed therein under section 121 of this title, and within the scope of the requirements of the treaty and the Regulations.

"§ 373. Improper applicant 35 USC 373.

"An international application designating the United States, shall not be accepted by the Patent Office for the national stage if it was filed by anyone not qualified under chapter 11 of this title to be an applicant for the purpose of filing a national application in the United States. Such international applications shall not serve as the basis for the benefit of an earlier filing date under section 120 of this title in a subsequently filed application, but may serve as the basis for a claim of the right of priority under section 119 of this title, if the United States was not the sole country designated in such international application. 35 USC 111 et seq. Post, p. 692. 35 USC 119.

"§ 374. Publication of international application: Effect 35 USC 374.

"The publication under the treaty of an international application shall confer no rights and shall have no effect under this title other than that of a printed publication.

"§ 375. Patent issued on international application: Effect 35 USC 375.

"(a) A patent may be issued by the Commissioner based on an international application designating the United States, in accordance with the provisions of this title. Subject to section 102(e) of this title, such patent shall have the force and effect of a patent issued on a national application filed under the provisions of chapter 11 of this title. Post, p. 691.

"(b) Where due to an incorrect translation the scope of a patent granted on an international application designating the United States, which was not originally filed in the English language, exceeds the scope of the international application in its original language, a court of competent jurisdiction may retroactively limit the scope of the patent, by declaring it unenforceable to the extent that it exceeds the scope of the international application in its original language.

35 USC 376. **"§ 376. Fees**

"(a) The required payment of the international fee, which amount is specified in the Regulations, shall be paid in United States currency. The Patent Office may also charge the following fees:

"(1) A transmittal fee (see section 361(d));

"(2) A search fee (see section 361(d));

"(3) A supplemental search fee (to be paid when required);

"(4) A national fee (see section 371(c));

"(5) A special fee (to be paid when required; see section 372(c));

"(6) Such other fees as established by the Commissioner.

"(b) The amounts of fees specified in subsection (a) of this section, except the international fee, shall be prescribed by the Commissioner. He may refund any sum paid by mistake or in excess of the fees so specified, or if required under the treaty and the Regulations. The Commissioner may also refund any part of the search fee, where he determines such refund to be warranted.".

SEC. 2. Section 6 of title 35, United States Code, is amended by adding a paragraph (d) to read as follows:

35 USC 6. **"§ 6. Duties of Commissioner**

* * * * * * *

"(d) The Commissioner, under the direction of the Secretary of Commerce, may, with the concurrence of the Secretary of State, allocate funds appropriated to the Patent Office, to the Department of State for the purpose of payment of the share on the part of the United States to the working capital fund established under the Patent Cooperation Treaty. Contributions to cover the share on the part of the United States of any operating deficits of the International Bureau under the Patent Cooperation Treaty shall be included in the annual budget of the Patent Office and may be transferred by the Commissioner, under the direction of the Secretary of Commerce, to the Department of State for the purpose of making payments thereof to the International Bureau.".

SEC. 3. Item 1 of section 41(a) of title 35, United States Code, is amended to read as follows:

35 USC 41. **"§ 41. Patent fees**

"(a) The Commissioner shall charge the following fees:

"1. On filing each application for an original patent, except in design cases, $65; in addition on filing or on presentation at any other time, $10 for each claim in independent form which is in excess of one, and $2, for each claim (whether independent or dependent) which is in excess of ten. For the purpose of computing fees, a multiple dependent claim as referred to in section 112 of this title or any claim depending therefrom shall be considered as separate dependent claims in accordance with the number of claims to which reference is made. Errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner.".

Post, p. 691.

SEC. 4. Section 42 of title 35, United States Code, is amended to read as follows:

35 USC 42. **"§ 42. Payment of patent fees; return of excess amounts**

"All patent fees shall be paid to the Commissioner who, except as provided in sections 361(b) and 376(b) of this title, shall deposit the same in the Treasury of the United States in such manner as the Secretary of the Treasury directs, and the Commissioner may refund any sum paid by mistake or in excess of the fee required by law.".

Ante, p. 686, Supra.

SEC. 5. Paragraph (e) of section 102 of title 35, United States Code, is amended to read as follows:

"§ 102. Conditions for patentability; novelty and loss of right to patent 35 USC 102.

* * * * * * *

"(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent, or".

SEC. 6. The first sentence of section 104 of title 35, United State Code, is amended to read as follows:

"§ 104. Invention made abroad 35 USC 104.

"In proceedings in the Patent Office and in the courts, an applicant for a patent, or a patentee, may not establish a date of invention by reference to knowledge or use thereof, or other activity with respect thereto, in a foreign country, except as provided in sections 119 and 365 of this title.". 35 USC 119.

SEC. 7. The second sentence of the second paragraph of section 112 of title 35, United States Code, is amended to read as follows: Ante, p. 686.

"§ 112. Specification 35 USC 112.

* * * * * * *

"A claim may be written in independent or, if the nature of the case admits, in dependent or multiple dependent form.

"Subject to the following paragraph, a claim in dependent form shall contain a reference to a claim previously set forth and then specify a further limitation of the subject matter claimed. A claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers.

"A claim in multiple dependent form shall contain a reference, in the alternative only, to more than one claim previously set forth and then specify a further limitation of the subject matter claimed. A multiple dependent claim shall not serve as a basis for any other multiple dependent claim. A multiple dependent claim shall be construed to incorporate by reference all the limitations of the particular claim in relation to which it is being considered.".

SEC. 8. Section 113 of title 35, United States Code, is amended to read as follows:

"§ 113. Drawings 35 USC 113.

"The applicant shall furnish a drawing where necessary for the understanding of the subject matter sought to be patented. When the nature of such subject matter admits of illustration by a drawing and the applicant has not furnished such a drawing, the Commissioner may require its submission within a time period of not less than two months from the sending of a notice thereof. Drawings submitted after the filing date of the application may not be used (i) to overcome any insufficiency of the specification due to lack of an enabling disclosure or otherwise inadequate disclosure therein, or (ii) to supplement the original disclosure thereof for the purpose of interpretation of the scope of any claim.".

SEC. 9. Section 120 of title 35, United States Code, is amended to read as follows:

35 USC 120.

"§ 120. Benefit of earlier filing date in the United States

"An application for patent for an invention disclosed in the manner
35 USC 112. provided by the first paragraph of section 112 of this title in an application previously filed in the United States, or as provided by section
Ante, p. 686. 363 of this title, by the same inventor shall have the same effect, as to such invention, as though filed on the date of the prior application, if filed before the patenting or abandonment of or termination of proceedings on the first application or on an application similarly entitled to the benefit of the filing date of the first application and if it contains or is amended to contain a specific reference to the earlier filed application.".

SEC. 10. The first paragraph of section 282 of title 35, United States Code, is amended to read as follows:

35 USC 282.

"§ 282. Presumption of validity; defenses

"A patent shall be presumed valid. Each claim of a patent (whether in independent, dependent, or multiple dependent form) shall be presumed valid independently of the validity of other claims; dependent or multiple dependent claims shall be presumed valid even though dependent upon an invalid claim. The burden of establishing invalidity of a patent or any claim thereof shall rest on the party asserting such invalidity.".

Effective dates. 35 USC 351 note.

SEC. 11. (a) Section 1 of this Act shall come into force on the same day as the entry into force of the Patent Cooperation Treaty with respect to the United States. It shall apply to international and national applications filed on and after this effective date, even though entitled to the benefit of an earlier filing date, and to patents issued on such applications.

(b) Sections 2 to 10 of this Act shall take effect on the same day as section 1 of this Act and shall apply to all applications for patent actually filed in the United States on and after this effective date, as well as to international applications where applicable.

(c) Applications for patent on file in the Patent Office on the effective date of this Act, and patents issued on such applications, shall be governed by the provisions of title 35, United States Code, in effect immediately prior to the effective date of this Act.

Approved November 14, 1975.

LEGISLATIVE HISTORY:

HOUSE REPORT No. 94-592 (Comm. on the Judiciary).
SENATE REPORT No. 94-215 (Comm. on the Judiciary).
CONGRESSIONAL RECORD, Vol. 121 (1975):
June 21, considered and passed Senate.
Nov. 3, considered and passed House.

(93) TITLE 37—PATENTS, TRADEMARKS, AND COPYRIGHTS

CHAPTER I—PATENT AND TRADEMARK OFFICE, DEPARTMENT OF COMMERCE

PART 1—RULES OF PRACTICE IN PATENT CASES

Rule Promulgation Relating to Implementation of the Patent Cooperation Treaty

AGENCY: Patent and Trademark Office, Commerce.

ACTION: Final Rule.

SUMMARY: This notice adopts rule changes which permit the filing of United States national patent applications in the format required by the Patent Cooperation Treaty which entered into force on January 24, 1978. Some of these rule changes are necessary in order that international applications arriving for national examination in the United States Patent and Trademark Office as a Designated Office are formally acceptable. The changes also permit applicants for United States patents to file their United States national applications in the same format as that required by the Patent Cooperation Treaty, which is also the format required by the European Patent Convention. Other changes are made in the rules which relate to the filing of international and national applications.

DATES: Effective date, June 1, 1978. The amended rules apply to national and international applications filed on and after the effective date. It should be noted that international applications may be filed on and after June 1, 1978.

FOR FURTHER INFORMATION CONTACT: Mr. Louis O. Maassel by telephone at (703) 557–3070, or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

SUPPLEMENTARY INFORMATION: This notice promulgates a number of previously proposed rule changes relating to the filing of international applications under the Patent Cooperation Treaty and the filing of United States national applications which have the same format as international applications. Notice was given on January 12, 1977 in the Federal Register (42 FR 2632–2644) and on February 8, 1977 in the Official Gazette (955 O.G. 350–363) of a proposal to amend Title 37 of the Code of Federal Regulations upon the entry into force of the Patent Cooperation Treaty and Public Law 94–131 (94th Congress; 89 Stat. 685). Interested persons were invited to comment on the proposal on or before May 26, 1977, on which date a public hearing was held. The time for submitting written comments was extended until August 31, 1977 by a notice published on June 23, 1977 in the Federal Register (42 FR 31812) and on July 12, 1977 in the Official Gazette (960 O.G. 8). Twenty-four comments relevant to the proposed rule changes were received. The comments relating to the rules established in this notice are discussed in the commentary of the rules. A transcript of all comments presented by two persons at the oral hearing, and the written statements received are available for public inspection in Room 11E10 of Crystal Plaza Building 3, 2021 Jefferson Davis Highway, Arlington, Virginia. Some of the rules of the above-mentioned proposals, namely, sections 1.75, 1.81 and 1.83, have already been promulgated by the rule change which appeared in the Federal Register of January 31, 1978 at 43 FR 4014–4015 and on February 21, 1978 in the Official Gazette at 967 O.G. 12. This promulgation permits the filing of United States national applications in the same format as international applications and also makes a number of other changes in the rules.

Comments on Adopted Rules

No comments were received relating to sections 1.1, 1.4, 1.5, 1.8, 1.9, and 1.12. These sections are promulgated as proposed.

Section 1.14 received three comments. One letter suggested adding another paragraph (e) to mention that defense agencies are given access to applications relating to national security. Another letter indicated no objection to such an addition but did not consider it necessary. The first mentioned comment was not adopted since the proposed paragraph (e) would be restating a provision appearing in section 5.1(b). The third letter questioned whether the Patent and Trademark Office would supply a copy of the international application "pamphlet" after it was published. In response to this comment it should be noted that the Office will supply copies of the "pamphlet" at the regular price of 30¢ per page but that it will not give access to or supply copies of any pending national or international application without the written authorization of the applicant, assignee or attorney or agent of record. Paragraph (c) has been revised to refer to the Department of Energy which now has the pertinent responsibilities under the Atomic Energy Act.

Section 1.21 received one comment indicating that it was not clear whether the fee was required for both the international-type search and search report or only for the search report. The rule has been amended in order to clarify that the fee is required for the report only.

Sections 1.23 and 1.25 received no comments and are adopted as proposed.

Section 1.26 has been revised from the proposal by providing for only three choices as to refund rather than five. This change was made to simplify the determination of the amount of the refund, if any. In addition, the rounding of refunds was changed from the next higher multiple of $10 to the next higher multiple of $5 for greater preciseness.

Section 1.52 received one comment which proposed changing the wording of 1.52(c) to permit applicant's representative, as well as the applicant himself, to initial changes to application papers made before filing. Since no change in section 1.52(c) had been proposed, the suggested change is not required by the Patent Cooperation Treaty, the proposal is not being adopted in this promulgation.

Two comments were received noting that the proposed wording in section 1.55 did not distinguish between the prior art effective dates of international applications filed in the United States and those filed outside the United States. The proposed wording is correct since it corresponds with the language of 35 U.S.C. 102(e) as amended by Public Law 94–131.

Section 1.57 received two comments to the effect that applicants of international applications were given greater rights than national applicants since the proposed rule states that it is not required that the applicant of an international application have the oath or declaration attached to the specification at the time of signing. In response, it is acknowledged that the practice set forth in proposed section 1.57 is somewhat different for the two filing routes; however, the proposed wording follows the concepts set forth in 35 U.S.C. 371(c) as added by Public Law 94–131. Accordingly, no change is considered to be necessary or desirable.

One comment was received relating to section 1.58. The comment indicated the rule should relate only to complex chemical and mathematical formulas and tables. This comment has been adopted by revising section 1.58(c) to add the word "complex" before "formulas."

Section 1.61 received two comments from one person. The first comment relating to a question of where an international application would be examined for issuance, is not understood since international applications are not issued. However, since the comment did raise the matter of examination, a phrase has been added to indicate clearly that the requirements of section 1.61 must be followed if an examination for a U.S. patent is desired in an international application. The second comment indicated that there was no antecedent basis for the "mailing date of the declaration to the applicant." The declaration is clearly mentioned at the beginning of paragraph 1.61(b). The meaning of the mailing date of such a document to the applicant appears to be sufficently clear. No change is considered to be necessary in response to the second comment. In addition, numbers have been added to each of the listed items to improve readability.

Section 1.70 received two comments. Both related to providing uniformity between sections 1.65 and 1.70. It should be noted that section 1.65 was amended shortly after the time the proposal was published. Proposed section 1.70 has accordingly been amended to include the newly added wording of section 1.65. The wording of proposed section 1.70 has also been amended to provide for both genders.

Section 1.72 received no comments and is adopted as proposed.

One comment was submitted concerning section 1.77 which suggested that the rule specify that an attorney's docket number and the name of the inventor may be placed on the initial page of an application. Such a procedure is currently permitted, although not specifically mentioned in the rules. Since such data is not considered to be one of the application elements, the amendment of section 1.77 is not considered to be necessary. The rule is adopted as proposed.

No comments were received concerning section 1.78. This rule is adopted as proposed.

Section 1.84 relating to standards for drawings received four comments. One suggestion, not adopted, was that drawings on 8½ by 11 inch paper be permitted. Although this size is close to DIN size A4, the additional processing and printing problems which would result from three different paper sizes appear to be greater than the resulting benefits at this time. Some experience with the two sizes proposed is felt to be desirable before any additional alternatives are permitted. One comment proposed that this rule be adopted as early as possible. Since drawings under existing rules can also be prepared in a way which will later permit easy compliance with PCT requirements, it was considered unnecessary to adopt this suggestion. Two comments were received concerning the interpretation of paragraph (i). Although the wording of this paragraph is in substance the wording of PCT Rule 11.13(i), second sentence, it appears that some clarification is necessary. Therefore proposed paragraph (i) has been amended to clarify the intended requirements. The reference to blue ink in subparagraph (c) has been deleted since it has been deleted from the Treaty regulations.

Section 1.104 received one comment, which also related to section 1.21, to the effect that the proposed wording was not clear. The proposed section has been slightly revised and a note added for purpose of clarity. The preparation of a formal international-type search report is not required by the U.S. Patent and Trademark Office in order for the international-type search to serve as the basis for a search fee refund in a later international application.

Section 1.141 was commented upon by seven persons. The comments of several persons indicated that it appeared that paragraph 1.141(e) was unnecessary. This view is accepted; accordingly, paragraph 1.141(e) has been deleted from the promulgation. Another comment indicated that no need was seen to limit the wording of subparagraph (c) to only a few categories of claims. The treaty requires that the arrangements of claims described in (c), (i) and (ii) be considered as one invention, subject to the conditions stated in PCT Rule 13.2. It should be noted that proposed subparagraphs (c), (i) and (ii) are substantially a copy of PCT Rule 13.2. However, in view of this and other comments and for clarity, sections 1.141 and 1.146 and 1.481 and 1.482 have been substantially rewritten, amplified, and reorganized to clarify the meaning of certain terms, namely, "specially adapted" and "specifically designed", to conform more closely to current Office practice as set forth in MPEP sections 806.05(e)–(g). Both proposed rules 1.141 and 1.146 have been modified to clarify that the rules make little change in current restriction practice. The differences between the PCT unity of invention requirement and current restriction practice are minimal. The rewriting and reorganization of proposed sections 1.141 and 1.146 substantially states the current rule language except that the five species limitation is removed. Other comments indicated additional clarification of the other paragraphs would also be helpful. Such amendments have been made as mentioned.

Four comments were submitted relating to section 1.146. One comment received indicated that no reason was found in the PCT as to why an election of species is required regardless of whether or not there is an allowable generic claim. Although there is no reason in the PCT for such a requirement, the rule was amended to reflect current Office practice which in MPEP section 808.01(a) allows the examiner to require an election of species prior to the search. The second comment indicated a preference to maintain current restriction practice in all national applications which were not filed under the PCT route. This comment has been satisfied by the rewriting of the rules mentioned above. The third and fourth comments indicated that no need was seen to seek a requirement for restriction in all cases. These comments are similarly satisfied by the rewriting of the rules.

No comments were received concerning sections 1.318 and 1.331. These rules have been adopted as proposed.

Section 1.401 received no comments; however, "or" has been changed to—and—in subparagraph (a).

Section 1.412 was commented on by two persons. One comment suggested that a subparagraph (5) be added to refer to the licensing requirements of Part 5. This proposal has been adopted. The other comment considered the addition unnecessary.

Section 1.413 received no comments. However, the wording has been revised to provide for the United States Patent and Trademark Office to act as an International Searching Authority for other Receiving Offices subject to the approval of an agreement as such by the Commissioner. The name of the International Searching Authority has also been changed to follow the Administrative Instructions.

One comment we received relative to section 1.141 questioning the use of the word "will" in subparagraph (a). After review, no problem is seen with the proposed wording; therefore, no change is considered to be necessary.

Section 1.415 received no comments and is adopted as proposed.

Section 1.421 received comments from two persons. One comment is related to the requirement that the inventor must file the international application if patent protection is desired in the United States as a Designated State. This provision is set forth in 35 U.S.C. 373 and cannot be changed by modification of the rules. However, the rules, as proposed, have been amended and subparagraph (d) added to permit the attorney or agent to sign on behalf of the inventor. The other comment relates to the requirement that only nationals and residents of the United States can file in the United States Receiving Office. The requirement appears in 35 U.S.C. 361(a). As to the situation involving an invention made in this country by an inventor who is neither a resident nor national, such an inventor may file a regular U.S. national application or may obtain a license under 35 U.S.C. 184 to file in the foreign Receiving Office for the country of which the inventor is a resident or national.

No comments were received concerning sections 1.422, 1.423, 1.424 and 1.425. Except for the addition of one reference to the feminine gender, these rules are adopted as proposed.

Sections 1.431 and 1.432 were both the subject of a question as to whether the withdrawal of the international application would result in withdrawal of the national application. The withdrawal of the international application would result in the withdrawal of the designation of all States. If the United States was designated in an international application which was withdrawn before the requirements of 35 U.S.C. 371 were fulfilled, no processing of that withdrawn application would occur except as provided under PCT Article 25. These sections are adopted as proposed.

Section 1.433 received two comments, both related to the fact that the broad reference to PCT Rule 11 did not clearly indicate what size papers were required. This matter has been clarified in the promulgated rule to indicate that DIN A4 size sheets are required.

One comment was received concerning section 1.434 which correctly noted that the second arrow used to indicate additions in the proposal, should have been at the end of the paragraph.

No comments were received concerning sections 1.435, 1.437 and 1.438. These sections are adopted as proposed.

Section 1.436 has been amended to specifically include the requirement of PCT Rule 6.1(a), that the number of claims shall be reasonable.

Two comments were received relating to section 1.445 which indicated that the proposed fee amounts were too high. After review, it is felt that the fee amounts are set as required to cover 100% of the costs involved.

No comments were received concerning section 1.446; however, the number of refund choices has been reduced from 5 to 3 to simplify the determination choices.

No comments were received concerning section 1.451. Subparagraph (c) was amended to clarify the intent of the rule.

Section 1.455 received one comment which indicated that the expression "common representative" was not understood. This comment has been answered by adding a citation to PCT Rule 4.8, which explains the expression.

Section 1.461 received comments from four persons which proposed that a new subparagraph (c) be added which warns that a foreign filing license may be required to transmit a copy of the international application outside the United States. This suggestion has been adopted.

One comment relative to section 1.465 noted that the notation "PCT" was inadvertently omitted before a rule citation. This, along with a rule citation, have been corrected in the promulgation.

Section 1.468 received two comments, both related to problems raised by subparagraph (b). Upon reconsideration it appears that the broad language of subparagraph (a) and the reference to PCT Rule 82 is sufficient; accordingly, proposed subparagraph (b) has been deleted.

Section 1.471 received one comment which related to amendments at the national stage. Since this rule relates only to

international stage amendments, the rule is promulgated as proposed.

No comments were received relating to section 1.475; accordingly, the rule is promulgated as proposed.

Section 1.481 received one general comment which related to national practice rather than the international practice covered by this rule. However, changes were made in the proposed rules 1.481 and 1.482 to clarify them and make them more understandable. For one, it now makes clear that PCT Rule 13 is consistent with much of current practice under sections 1.141 and 1.146 with several exceptions specifically set out in section 1.481. The protest provisions have also been moved from section 1.481 to section 1.482 since the handling of protests is somewhat different subject matter than the other contents of section 1.481. In addition, subsection (c) of proposed section 1.482 was moved to section 1.481 where the subject matter is more pertinent. The other subsections of proposed subsection 1.482 were eliminated as unnecessary since they are part of existing practice and do not require inclusion in the rules specifically. The reference in section 1.481 to PCT Rule 13 in effect, includes these deleted subsections by reference.

A number of references to sections of the Administrative Instructions have been changed to reflect changes in the numbering of sections in the current version of the Administrative Instructions.

PART 3

Sections 3.56 and 3.57 received two comments. One comment essentially involved deleting the basic requirements of section 1.70. This proposal has not been adopted since it also affects section 1.65 and must be given careful study and an opportunity for comment allowed before any such change may be made. The other proposal indicated that the "duty of disclosure" provisions were not in these forms. The forms have been revised to include this duty.

PART 5

Section 5.1 received comments from two persons. Subparagraph (a) has been substantially rewritten to provide for filing of international applications in the United States Receiving Office without a license for foreign filing but for limiting the transmittal of the international application to a foreign national or international agency. Subparagraph (b) has been revised to refer to the Department of Energy.

Section 5.3 received comments from two persons which related to subparagraph (d). This subparagraph has been rewritten in view of the comments received.

Section 5.11 received comments from ten persons who all suggested that the rule be rewritten to permit the initial filing of an international application in the United States Receiving Office without a license. The rule has been rewritten in this manner.

Section 5.13 is amended due to a submitted proposal although the rule was not included in the proposed rule change notice. The changes made in section 5.13 follow the concepts suggested by numerous comments to section 5.11. Therefore, it is felt that the change can be made even though such a change was not proposed.

Section 5.14 received one comment as to possible processing problems but no suggestion was made; accordingly, the section is adopted as proposed.

Section 5.15 has been revised as suggested by two persons to refer to transmittal of the international application rather than filing thereof.

No comments were received relative to Section 5.17; this rule is adopted as proposed.

In a number of instances, references to the masculine gender have been deleted.

The Patent and Trademark Office has determined that this document does not contain a major proposal requiring preparation of an Economic Impact Statement Under Executive Orders 11821 and 11949 and OMB Circular A-107.

The following table of contents indicates the contents of the promulgated subparts and the location of added sections and section headings.

PART 1—RULES OF PRACTICE IN PATENT CASES

SUBPART A—GENERAL PROVISIONS

(§§ 1.1–1.26)

General Information and Correspondence

• • •

§ 1.9 Definitions.

SUBPART B—NATIONAL PROCESSING PROVISIONS

(§§ 1.31–1.352)

• • • • • •

The Application

• • •

§ 1.61 Filing of applications in the United States of America as a Designated Office.

Oath or Declaration

• • •

§ 1.70 Content of oath or declaration relating to content of and amendments to an application under 35 U.S.C. 371(c)(4).

• • • • • •

Allowance and Issue of Patent

• • •

§ 1.318 *Notification of national publication of a patent based on an international application*

• • • • • •

SUBPART C—INTERNATIONAL PROCESSING PROVISIONS

(§§ 1.401–1.482)

General Information

§ 1.401 Definitions of terms under the Patent Cooperation Treaty.
§ 1.412 The United States Receiving Office.
§ 1.413 The United States International Searching Authority.
§ 1.414 The United States Designated Office.
§ 1.415 The International Bureau.

Who May File an International Application

§ 1.421 Applicant for international application.
§ 1.422 When the inventor is dead.
§ 1.423 When the inventor is insane or legally incapacitated.
§ 1.424 Joint inventors.
§ 1.425 Filing by other than inventor.

The International Application

§ 1.431 International application requirements.
§ 1.432 Designation of States and payment of designation fees.
§ 1.433 Physical requirements of international application.
§ 1.434 The Request.
§ 1.435 The description.
§ 1.436 The claims.
§ 1.437 The drawings.
§ 1.438 The abstract.

Fees

§ 1.445 International application filing and processing fees.
§ 1.446 Refund of international application filing and processing fees.

Priority

§ 1.451 The priority claim and priority document in an international application.

Representation

§ 1.455 Representation in international applications.

Transmittal of Record Copy

§ 1.461 Procedures for transmittal of record copy to the International Bureau.

Timing

§ 1.465 Timing of application processing based on the priority date.
§ 1.468 Delays in meeting time limits.

Amendments

§ 1.471 Corrections and amendments during international processing.
§ 1.475 Changes in person, name, or address of applicants and inventors.

Unity of Invention

§ 1.481 Determination of unity of invention before the International Searching Authority.
§ 1.482 Protest to lack of unity of invention.

PART 3—FORMS FOR PATENT CASES

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§ 3.56 Oath to be filed with United States Designated Office under 35 U.S.C. 371(c)(4).
§ 3.57 Declaration to be filed with United States Designated Office under 35 U.S.C. 371(c)(4).

Accordingly, 37 CFR parts 1, 3 and 5 are amended as follows:

1. By revising § 1.1 to read as follows:

§ 1.1 *All communications to be addressed to Commissioner of Patents and Trademarks.*

All letters and other communications intended for the Patent and Trademark Office must be addressed to "Commissioner of Patents and Trademarks," Washington, D.C. 20231. When appropriate, a letter should also be marked for the attention of a particular office or individual. Letters and other communications relating to international applications during the international stage and prior to the assignment of a national serial number should be additionally marked "Box PCT."

NOTE: §§ 1.1 to 1.26 are applicable to trademark cases as well as to national and international patent cases except for provisions specifically directed to patent cases. See § 1.9 for definitions of "national application" and "international application."

2. By revising paragraph (a) of § 1.4 to read as follows:

§ 1.4 *Nature of correspondence.*

(a) Correspondence with the Patent and Trademark Office comprises (1) correspondence relating to services and facilities of the Office, such as general inquiries, requests for publications supplied by the Office, orders for printed copies of patents or trademark registrations, orders for copies of records, transmission of assignments for recording, and the like, and (2) correspondence in and relating to a particular application or other proceeding in the Office. See particularly the rules relating to the filing, processing, or other proceedings of national applications in Subpart B, §§ 1.31 to 1.352; of international applications in Subpart C, §§ 1.401 to 1.482; and of Trademark applications §§ 2.11 to 2.189.

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3. By revising paragraph (a) of § 1.5 to read as follows:

§ 1.5 *Identification of application, patent or registration.*

(a) When a letter concerns an application for patent, it should state the name of the applicant, the title of the invention, the serial number or international application number of the application, the date of filing the same, and, if known, the group art unit and name of the examiner to which it has been assigned (see § 1.55).

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4. By revising paragraph (a)(1) and adding paragraph (xi) of § 1.8 to read as follows:

§ 1.8 *Certificate of mailing.*

(a) Except in the cases enumerated below, papers and fees required to be filed in the Patent and Trademark Office within a set period of time will be considered as being timely filed if (1) they are addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, and deposited with the United States Postal Service with sufficient postage as first class mail prior to expiration of the set period, and (2) they are accompanied by a certificate stating the date of deposit (see forms, §§ 3.55 and 4.23). The person signing the certificate should have reasonable basis to expect that the correspondence would be mailed on or before the date indicated. The actual date of receipt of the paper or fee will be used for all other purposes. This procedure does not apply to the following:

(i) The filing of national applications for patent;

• • • • •

(xi) The filing of international applications for patent and papers relating thereto.

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5. A new section 1.9 is added to read as follows:

§ 1.9 *Definitions.*

(a) A national application as used in this Chapter means a United States national application for patent which was either filed in the Office under 35 U.S.C. 111 or which resulted from an international application after compliance with 35 U.S.C. 371.

(b) An international application as used in this Chapter means an international application for patent filed under the Patent Cooperation Treaty prior to entering national processing at the Designated Office stage.

6. By revising § 1.12 to read as follows:

§ 1.12 *Assignment records open to public inspection.*

The assignment records, relating to original or reissue patents, including digests and indexes, are open to public inspection and copies of any instrument recorded may be obtained upon payment of the fee therefor. Assignment records, digests and indexes, relating to any pending or abandoned application are not available to the public. Copies of any such assignment records and information with respect thereto shall be obtainable only upon written authority of the applicant or his assignee or attorney or agent or upon a showing that the person seeking such information is a bona fide prospective or actual purchaser, mortgagee or licensee of such application, unless it shall be necessary to the proper conduct of business before the Office or as provided by these rules. An order for a copy of an assignment should give the identification of the record. If identified only by the name of the patentee and number of the patent, or in the case of a trademark registration by the name of the registrant and number of the registration, or by name of the applicant and serial number or international application number of the application, an extra charge will be made for the time consumed in making a search for such assignment.

7. By revising paragraphs (a) and (c) of § 1.14 to read as follows:

§ 1.14 *Patent applications preserved in secrecy.*

(a) Except as provided in § 1.11(b) pending patent applications are preserved in secrecy. No information will be given by the Office respecting the filing by any particular person of an application for a patent, the pendency of any particular case before it, or the subject matter of any particular application, nor will access be given to or copies furnished of any pending application or papers relating thereto, without written authority in that particular application from the applicant or his assignee or attorney or agent of record, unless the application has been identified by serial number in a published patent document or the United States of America has been indicated as a Designated State in a published international application, in which case status information such as whether it is pending, abandoned or patented may be supplied, or unless it shall be necessary to the proper conduct of business before the Office or as provided by this part. Where an application has been patented, the patent number and issue date may also be supplied.

• • • • •

(c) Applications for patents which disclose, or which appear to disclose, or which purport to disclose, inventions or discoveries relating to atomic energy are reported to the Department of Energy, which Department will be given access to such applications, but such reporting does not constitute a determination that the subject matter of each application so reported is in fact useful or an invention or discovery or that such application in fact discloses subject matter in categories specified by sections 151(c) and 151(d) of the Atomic Energy Act of 1954, 68 Stat. 919; 42 U.S.C. 2181 (c) and (d).

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8. By adding a new paragraph (w) to § 1.21 to read as follows:

§ 1.21 *Patent and miscellaneous fees and charges.*

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(w) For preparing an international-type search report of an international-type search made at the time of the first action on the merits in a national patent application... $25.00

NOTE: The Patent and Trademark Office does not require that a formal report be prepared of an international-type search in order to obtain a search fee refund in a later filed international application. For fees relating to processing of international applications, see § 1.445.

9. By revising § 1.23 to read as follows:

§ 1.23 *Method of payment.*

All payments of money required for Patent and Trademark Office fees, including fees for the processing of international applications (§ 1.445), should be made in United States specie, Treasury notes, national bank notes, post office money orders, or by certified check. If sent in any other form, the Office may delay or cancel the credit until collection is made. Money orders and checks must be made payable to the Commissioner of Patents and Trademarks. Remittances from foreign countries must be payable and immediately negotiable in the United States for the full amount of the fee required. Money sent by mail to the Patent and Trademark Office will be at the risk of the sender; letters containing money should be registered.

10. By revising paragraph (b) of § 1.25 to read as follows:

§ 1.25 *Deposit accounts.*

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(b) Filing, issue, appeal, international-type search report, international application processing, and petition fees may be charged against these accounts.

11. By revising § 1.26 to read as follows:

§ 1.26 *Refunds.*

Money paid by actual mistake or in excess, such as a payment not required by law, will be refunded, but a mere change of purpose after the payment of money, as when a party desires to withdraw his application or to withdraw an appeal, will not entitle a party to demand such a return. Refund of a portion of any international search fee paid to the Patent and Trademark Office may be made where the prior art search made during the subsequent examination of a national application is wholly or partly based on the earlier international search made in the international application for which the search fee was paid. The amount of the refund will be as determined by the examiner according to the value of the prior international search made by the Patent and Trademark Office as an International Searching Authority, as 90%, 45% or 0% of the international search fee. If the amount of the refund is not a multiple of $5, it will be rounded to the next higher multiple of $5. (Note § 1.446 for refund of the search fee in an international application.) Amounts of ten cents or less will not be returned unless specifically demanded, within a reasonable time, nor will the payer be notified of such amount; amounts over ten cents but less than one dollar may be returned in postage stamps, and other amounts by check.

12. By revising paragraphs (a) and (b) of § 1.52 to read as follows:

§ 1.52 *Language, paper, writing, margins.*

(a) The application, any amendments or corrections thereto, and the oath or declaration must be in the English language except as provided for in § 1.69, or be accompanied by a verified translation of the application and a translation of any corrections or amendments into the English language. All papers which are to become a part of the permanent records of the Patent and Trademark Office must be legibly written, typed, or printed in permanent ink or its equivalent in quality. All of the application papers must be presented in a form having sufficient clarity and contrast between the paper and the writing, typing, or printing thereon to permit the direct production of readily legible copies in any number by use of photographic, electrostatic, photooffset, and microfilming processes. If the papers are not of the required quality, substitute typewritten or printed papers of suitable quality may be required.

(b) The application papers (specification, including claims, abstract, oath or declaration, and papers as provided for in §§ 1.42, 1.43, 1.47, etc.) and also papers subsequently filed, must be plainly written on but one side of the paper. The size of all sheets of paper should be 8 to 8½ by 10½ to 13 inches (20.3 to 21.6 cm. by 26.6 to 33.0 cm.). A margin of at least approximately one inch (2.5 cm.) must be reserved on the left-hand side of each page. The top of each page of the application, including claims must have a margin of at least approximately ¾ inch (2 cm.). The lines of text must not be crowded too closely together; type-written lines should be 1½ or double spaced. The pages of the application, including claims and abstract, should be numbered consecutively, starting with 1, the numbers being centrally located above or preferably, below, the text.

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13. By adding paragraph (d) to § 1.55 to read as follows:

§ 1.55 *Serial number and filing date of application.*

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(d) The filing date of an international application designating the United States of America shall be treated as the filing date in the United States of America under PCT Article 11(3), except as provided in 35 U.S.C. 102(e).

14. By revising § 1.57 to read as follows:

§ 1.57 *Signature.*

(a) The application must be signed by the applicant in person. The signature to the oath or declaration under § 1.65 will be accepted as the signature to the application provided the oath or declaration under § 1.65 is attached to and refers to the specification and claims to which it applies. Otherwise the signature must appear at the end of the specification after the claims.

(b) The signature to the oath or declaration under § 1.70 will be accepted as the signature to the application provided the oath or declaration under § 1.70 specifically refers to the specification and claims to which it applies.

(c) Full names must be given, including at least one given name without abbreviation together with any other given name or initial.

15. By revising § 1.58 to read as follows:

§ 1.58 *Chemical and mathematical formulas and tables.*

(a) The specification, including the claims, may contain chemical and mathematical formulas, but shall not contain drawings or flow diagrams. The description portion of the specification may contain tables; claims may contain tables either if necessary to conform to 35 U.S.C. 112 or if otherwise found to be desirable.

(b) All tables and chemical and mathematical formulas in the specification, including claims, and amendments thereto, must be on paper which is flexible, strong, white, smooth, nonshiny and durable in order to permit use as camera copy when printing any patent which may issue. A good grade of bond paper is acceptable; watermarks should not be prominent. India ink or its equivalent, or solid black typewriter, should be used to secure perfectly black solid lines.

(c) To facilitate camera copying when printing, the width of formulas and tables as presented should be limited normally to 5 inches (12.7 cm.) so that it may appear as a single column in the printed patent. If it is not possible to limit the width of a formula or table to 5 inches (12.7 cm.), it is permissible to present the formula or table with a maximum width of 10¾ inches (23.3 cm.) and to place it sideways on the sheet. Type-written characters used in such formulas and tables must be from a block (nonscript) type font or lettering style having capital letters which are at least 0.08 inch (2.1 mm.) high (e.g., elite type). Hand lettering must be neat, clean, and have a minimum character height of 0.08 inch (2.1 mm.). A space at least ¼ inch (6.4 mm.) high should be provided between complex formulas and tables and the text. Tables should have the lines and columns of data closely spaced to conserve space, consistent with high degree of legibility.

16. By adding a new § 1.61 to read as follows:

§ 1.61 *Filing of applications in the United States of America as a Designated Office.*

(a) To maintain the benefit of the international filing date and obtain an examination as to the patentability of the invention in the United States, the applicant shall furnish to the United States Patent and Trademark Office not later than the expiration of 20 months from the priority date: (1) a copy of the international application with any amendments, unless it has been previously furnished by the International Bureau or unless it was originally filed in the United States Patent and Trademark Office; (2) a verified translation of the international application and a translation of any amendments into the English language, if originally filed elsewhere in another language; (3) the national fee (see § 1.445(a)(4)); and (4) an oath or declaration of the inventor (see § 1.70).

(b) Where an International Searching Authority has made a declaration that no international search report will be established because the international application relates to subject matter which it is not required to search, or because the application fails to comply with the prescribed requirements to such an extent that a meaningful search could not be carried out, the time for performing the acts referred to in paragraph (a) of this section is two months from the mailing date of the declaration to the applicant.

17. By adding a new § 1.70 to read as follows:

§ 1.70 *Content of oath or declaration relating to content of and amendments to an application under 35 U.S.C. 371 (c)(4).*

(a)(1) When an applicant of an international application, if the inventor, desires to enter the national stage under 35 U.S.C. 371, he or she must specifically identify the international application and any amendments thereto and state that he or she has reviewed the referred to application and any amendments, and that he or she verily believes himself or herself to be the original and first inventor or discoverer of the process, machine, manufacture, composition of matter, or improvement thereof, for which he or she solicits a patent; that he or she does not know and does not believe that the same was ever known or used in the United States of America before his or her invention or discovery thereof, and shall state of what country he or she is a citizen and where he or she resides and whether he or she is a sole or joint inventor of the invention claimed in his or her international application as filed or as amended. In every application the applicant must distinctly state that to the best of his or her knowledge and belief the invention has not been in public use or on sale in the United States of America more than one year prior to his or her international application, or patented or described in any printed publication in any country before his or her invention or more than one year prior to his or her international application, or patented or made the subject of an inventor's certificate in any foreign country prior to the date of his or her international application on an application filed by himself or herself or his or her legal representatives or assigns more than twelve months prior to his or her international application. He or she must acknowledge a duty to disclose information he or she is aware of which is material to the examination of the application. He or she shall state whether or not any application for patent or inventor's certificate on the same invention has been filed in any foreign country, either by himself or herself, or by his or her legal representatives or assigns. If any such application has been filed, the applicant shall name the country in which the earliest such application was filed, and shall give the day, month, and year of its filing; he or she shall also identify by country and by day, month, and year of filing, every such foreign application filed more than twelve months before the filing of the international application.

(2) This statement (i) must be subscribed to by the applicant, and (ii) must either (a) be sworn to (or affirmed) as provided in § 1.66, or (b) include the personal declaration of the applicant as prescribed in § 1.68.

(b) If the international application was made as provided in §§ 1.422, 1.423 or 1.425, the applicant shall state his or her relationship to the inventor and, upon information and belief, the facts which the inventor is required by this section to state.

18. By revising paragraph (b) of § 1.72 to read as follows:

§ 1.72 *Title and abstract.*

* * * * *

(b) A brief abstract of the technical disclosure in the specification must be set forth on a separate sheet, preferably following the claims under the heading "Abstract of the Disclosure." The purpose of the abstract is to enable the Patent and Trademark Office and the public generally to determine quickly from a cursory inspection the nature and gist of the technical disclosure. The abstract shall not be used for interpreting the scope of the claims.

19. By revising the text and heading of § 1.77 to read as follows:

§ 1.77 *Arrangement of application elements.*

The elements of the application should appear in the following order:

(a) Title of the invention; or an introductory portion stating the name, citizenship, and residence of the applicant, and the title of the invention may be used.
(b) (Reserved).
(c) Cross-references to related applications, if any.
(d) Brief summary of the invention.
(e) Brief description of the several views of the drawing, if there are drawings.
(f) Detailed description.
(g) Claim or claims.
(h) Signature. (See § 1.57).
(i) Abstract of the disclosure.
(j) Drawings.

20. By revising paragraph (a) of § 1.78 to read as follows:

§ 1.78 *Cross-references to other applications.*

When an applicant files an application claiming an invention disclosed in a prior filed copending national application or international application designating the United States of America of the same applicant, the second application must contain or be amended to contain in the first sentence of the specification following the title a reference to such prior application, identifying it by serial number and filing date or international application number and international filing date and indicating the relationship of the applications, if the benefit of the filing date of such prior application is to be claimed. Cross-references to other related applications may be made when appropriate. (See § 1.14(b)).

21. By revising paragraphs (a), (b), (c), (d), (e), (f), (i), (j) and (l) of § 1.84 to read as follows:

§ 1.84 *Standards for drawings.*

(a) *Paper and ink.* Drawings must be made upon paper which is flexible, strong, white, smooth, non-shiny and durable. Two-ply or three-ply bristol board is preferred. The surface of the paper should be calendered and of a quality which will permit erasure and correction with India ink. India ink, or its equivalent in quality, is preferred for pen drawings to secure perfectly black solid lines. The use of white pigment to cover lines is not normally acceptable.

(b) *Size of sheet and margins.* The size of the sheets on which drawings are made may either be exactly 8½ by 14 inches (21.6 by 35.6 cm.) or exactly 21.0 by 29.7 cm. (DIN size A4). All drawing sheets in a particular application must be the same size. One of the shorter sides of the sheet is regarded as its top.

(1) On 8½ by 14 inch drawing sheets, the drawing must include a top margin of 2 inches (5.1 cm.) and bottom and side margins of ¼ inch (6.4 mm.) from the edges, thereby leaving a "sight" precisely 8 by 11¾ inches (20.3 by 29.8 cm.). Margin border lines are not permitted. All work must be included within the "sight". The sheets may be provided with two ¼ inch (6.4 mm.) diameter holes having their centerlines spaced 11/16 inch (17.5 mm.) below the top edge and 2¾ inches (7.0 cm.) apart, said holes being equally spaced from the respective side edges.

(2) On 21.0 by 29.7 cm. drawing sheets, the drawing must include a top margin of at least 2.5 cm., a left side margin of 2.5 cm., a right side margin of 1.5 cm., and a bottom margin of 1.0 cm. Margin border lines are not

permitted. All work must be contained within a sight size not to exceed 17 by 26.2 cm.

(c) *Character of lines.* All drawings must be made with drafting instruments or by a process which will give them satisfactory reproduction characteristics. Every line and letter must be durable, black, sufficiently dense and dark, uniformly thick and well defined; the weight of all lines and letters must be heavy enough to permit adequate reproduction. This direction applies to all lines however fine, to shading, and to lines representing cut surfaces in sectional views. All lines must be clean, sharp, and solid. Fine or crowded lines should be avoided. Solid black should not be used for sectional or surface shading. Freehand work should be avoided wherever it is possible to do so.

(d) *Hatching and shading.* (1) Hatching should be made by oblique parallel lines spaced sufficiently apart to enable the lines to be distinguished without difficulty. (2) Heavy lines on the shade side of objects should preferably be used except where they tend to thicken the work and obscure reference characters. The light should come from the upper left-hand corner at an angle of 45°. Surface delineations should preferably be shown by proper shading, which should be open.

(e) *Scale.* The scale to which a drawing is made ought to be large enough to show the mechanism without crowding when the drawing is reduced in size to two-thirds in reproduction, and views of portions of the mechanism on a larger scale should be used when necessary to show details clearly; two or more sheets should be used if one does not give sufficient room to accomplish this end, but the number of sheets should not be more than is necessary.

(f) *Reference characters.* The different views should be consecutively numbered figures. Reference numerals (and letters, but numerals are preferred) must be plain, legible and carefully formed, and not be encircled. They should, if possible, measure at least one-eighth of an inch (3.2 mm.) in height so that they may bear reduction to one twenty-fourth of an inch (1.1 mm.); and they may be slightly larger when there is sufficient room. They should not be so placed in the close and complex parts of the drawing as to interfere with a thorough comprehension of the same, and therefore should rarely cross or mingle with the lines. When necessarily grouped around a certain part, they should be placed at a little distance, at the closest point where there is available space, and connected by lines with the parts to which they refer. They should not be placed upon hatched or shaded surfaces but when necessary, a blank space may be left in the hatching or shading where the character occurs so that it shall appear perfectly distinct and separate from the work. The same part of an invention appearing in more than one view of the drawing must always be designated by the same character, and the same character must never be used to designate different parts. Reference signs not mentioned in the description shall not appear in the drawing, and vice versa.

* * * * *

(i) *Views.* The drawing must contain as many figures as may be necessary to show the invention; the figures should be consecutively numbered if possible in the order in which they appear. The figures may be plan, elevation, section, or perspective views, and detail views of portions of elements, on a larger scale if necessary, may also be used. Exploded views, with the separated parts of the same figure embraced by a bracket, to show the relationship or order of assembly of various parts are permissible. When necessary, a view of a large machine or device in its entirety may be broken and extended over several sheets if there is no loss in facility of understanding the view. Where figures on two or more sheets form in effect a single complete figure, the figures on the several sheets should be so arranged that the complete figure can be understood by laying the drawing sheets adjacent to one another. The arrangement should be such that no part of any of the figures appearing on the various sheets are concealed and that the complete figure can be understood even though spaces will occur in the complete figure because of the margins on the drawing sheets. The plane upon which a sectional view is taken should be indicated on the general view by a broken line, the ends of which should be designated by numerals corresponding to the figure number of the sectional view and have arrows applied to indicate the direction in which the view is taken. A moved position may be shown by a broken line superimposed upon a suitable figure if this can be done without crowding, otherwise a separate figure must be used for this purpose. Modified forms of construction can only be shown in separate figures. Views should not be connected by projection lines nor should center lines be used.

(j) *Arrangement of views.* All views on the same sheet should stand in the same direction and, if possible, stand so that they can be read with the sheet held in an upright position. If views longer than the width of the sheet are necessary for the clearest illustration of the invention, the sheet may be turned on its side so that the top of the sheet with the appropriate top margin is on the right-hand side. One figure must not be placed upon another or within the outline of another.

* * * * *

(l) *Extraneous matter.* Identifying indicia (such as the attorney's docket number, inventor's name, number of sheets, etc.) not to exceed 2¾ inches (7.0 cm.) in width may be placed in a centered location between the side edges within three-fourths inch (19.1 mm.) of the top edge. Authorized security markings may be placed on the drawings provided they are outside the illustrations and are removed when the material is declassified. Other extraneous matter will not be permitted upon the face of a drawing.

* * * * *

22. By adding new paragraphs (c) and (d) to § 1.104 to read as follows:

§ 1.104 *Nature of examination; examiner's action.*

* * * * *

(c) An international-type search will be made in all national applications filed on and after June 1, 1978.

(d) Any national application may also have an international-type search report prepared thereon at the time of the national examination on the merits, upon specific written request therefor and payment of the international-type search report fee. See § 1.21(w) for amount of fee for preparation of international-type search report.

NOTE: The Patent and Trademark Office does not require that a formal report of an international-type search be prepared in order to obtain a search fee refund in a later filed international application.

23. By revising § 1.141 to read as follows:

§ 1.141 *Different inventions in one application.*

(a) Two or more independent and distinct inventions, that is, inventions which do not form a single general inventive concept, may not be claimed in one application, except that more than one species of an invention, not to exceed a reasonable number, may be specifically claimed in different claims in one application, provided the application also includes an allowable claim generic to all the claimed species and all the claims to species in excess of one are written in dependent form (§ 1.75) or otherwise include all the limitations of the generic claim.

(b) A group of claims of different categories in an application so linked as to form a single inventive concept are considered to be one invention. In particular any of the following groupings of claims of different categories may be included in the same application:

(i) in addition to a claim for a given product, (*a*) a claim for one process specially adapted for the manufacture of the said product, as where the process of making as claimed cannot be used to make other and materially different products; (*b*) a claim for one use of the said product, as where said use as claimed cannot be practiced with another materially different product; or (*c*) both (*a*) and (*b*);

(ii) in addition to a claim for a given process, a claim for one apparatus or means specifically designed for carrying out of the said process, that is, it cannot be used to practice another materially different process.

(c) If the situation of subparagraph (1) of paragraph (b) of this section exists where claims to all three categories, product, process and use, are included, and the product claims are not allowable, the use and process claims are not so linked as to form a single general inventive concept. Where the process and use claims are not so joined by an allowable linking product claim, the applicant will be required to elect either the use or the process for prosecution with the product claim.

24. By revising § 1.146 to read as follows:

§ 1.146 *Election of species.*

In the first action on an application containing a generic claim and claims restricted separately to each of more than one species embraced thereby, the examiner may require the applicant in his response to that action to elect that species of his or her invention to which his or her claims shall be restricted if no generic claim is held allowable. However, if such application contains claims directed to more than a reasonable number of species, the examiner may require restriction of the claims to not more than a reasonable number of species before taking further action in the case.

25. By adding a new § 1.318 to read as follows:

§ 1.318 *Notification of national publication of a patent based on an international application.*

The Office will notify the International Bureau when a patent is issued on an application filed under 35 U.S.C. 371, and there has been no previous international publication.

26. By revising paragraphs (a) and (c) of § 1.331 to read as follows:

§ 1.331 *Recording of assignments.*

(a) Assignments, including grants and conveyances, of patents, national applications, or international applications which designate the United States of America, will be recorded in the Patent and Trademark Office under 35 U.S.C. 261. Other instruments affecting title to a patent, a national application, or an international application which designates the United States of America, and licenses, even though the recording thereof may not serve as constructive notice under 35 U.S.C. 261, will be recorded as provided in this section or at the discretion of the Commissioner.

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(c) An instrument relating to a patent should identify the patent by number and date (the name of the inventor and title of the invention as stated in the patent should also be given); an instrument relating to a national application, or an international application which designates the United States of America should identify the application by serial number or international application number and date of filing (the name of the inventor and title of the invention as stated in the application should also be given), but if an assignment is executed concurrently with or subsequent to the execution of the application but before the application is filed or before its serial number or international application number and filing date are ascertained, it should adequately identify the application, as by its date of execution and name of the inventor and title of the invention: so that there can be no mistake as to the patent or application intended.

Subpart C

27. By adding a new § 1.401 to read as follows:

§ 1.401 *Definitions of terms under the Patent Cooperation Treaty.*

(a) The abbreviation "PCT" and the term "Treaty" mean the Patent Cooperation Treaty.

(b) "International Bureau" means the World Intellectual Property Organization located in Geneva, Switzerland.

(c) "Administrative Instructions" means that body of instructions for operating under the Patent Cooperation Treaty referred to in PCT Rule 89.

(d) "Request", when capitalized, means that element of the international application described in PCT Rules 3 and 4.

(e) "International application", as used in this Subchapter is defined in § 1.9(b).

(f) "Priority date" for the purposes of computing time limits under the Patent Cooperation Treaty is defined in PCT Art. 2 (xi). Note also § 1.465.

(g) Other terms and expressions in this Subpart C not defined in this section are to be taken in the sense indicated in PCT Art. 2 and 35 U.S.C. 351.

28. By adding a new § 1.412 to read as follows:

§ 1.412 *The United States Receiving Office.*

(a) The United States Patent and Trademark Office is a Receiving Office only for applicants who are residents or nationals of the United States of America.

(b) The Patent and Trademark Office, when acting as a Receiving Office, will be identified by the full title "United States Receiving Office" or by the abbreviation "RO/US."

(c) The major functions of the Receiving Office include:

(1) According of international filing dates to international applications meeting the requirements of PCT Art. 11(1), and PCT Rule 20;

(2) Assuring that international applications meet the standards for format and content of PCT Art. 14(1), PCT Rules 9, 26, 29.1, 37, 38, 91, and portions of PCT Rules 3 through 11:

(3) Collecting and, when required, transmitting fees due for processing international applications (PCT Rules 14, 15, 16);

(4) Transmitting the record and search copies to the International Bureau and International Searching Authority, respectively (PCT Rules 22 and 23); and

(5) Determining compliance with applicable requirements of Part 5 of this chapter.

29. By adding a new § 1.413 to read as follows:

§ 1.413 *The United States International Searching Authority.*

(a) Pursuant to appointment by the Assembly, the United States Patent and Trademark Office will act as an International Searching Authority for international applications filed in the United States Receiving Office and in other Receiving Offices as may be agreed upon by the Commissioner, in accordance with agreement between the Patent and Trademark Office and the International Bureau (PCT Art. 16(3)(b)).

(b) The Patent and Trademark Office, when acting as an International Searching Authority, will be identified by the full title "United States International Searching Authority" or by the abbreviation "ISA/US."

(c) The major functions of the International Searching Authority include:

(1) Approving or establishing the title and abstract;

(2) Considering the matter of unity of invention;

(3) Conducting international and international-type searches and preparing international and international-type search reports (PCT Art. 15, 17 and 18, and PCT Rules 25, 33 to 45 and 47); and

(4) Transmitting the international search report to the applicant and the International Bureau.

30. By adding a new § 1.414 to read as follows:

§ 1.414 *The United States Designated Office.*

(a) The United States Patent and Trademark Office will act as a Designated Office for international applications in which the United States of America has been designated as a State in which patent protection is desired.

(b) The Patent and Trademark Office, when acting as a Designated Office during international processing will be identified by the full title "United States Designated Office" or by abbreviation "DO/US."

(c) The major functions of the United States Designated Office in respect to international applications in which the United States of America has been designated, include:

(1) Receiving various notifications throughout the international stage;

(2) Accepting for regular national patentability examination international applications which satisfy the requirements of 35 U.S.C. 371; and

(3) Conducting reviews under PCT Article 25 for those international applications declared withdrawn.

31. By adding a new § 1.415 to read as follows:

§ 1.415 *The International Bureau.*

(a) The International Bureau is the World Intellectual Property Organization located at Geneva, Switzerland. It is the international intergovernmental organization which acts as the coordinating body under the Treaty and the Regulations (PCT Art. 2 (xix) and 35 U.S.C. 351(h)).

(b) The major functions of the International Bureau include:

(1) Publishing of international applications and the International Gazette;

(2) Transmitting copies of international applications to Designated Offices;

(3) Storing and maintaining record copies; and

(4) Transmitting information to authorities pertinent to the processing of specific international applications.

32. By adding a new § 1.421 to read as follows:

§ 1.421 *Applicant for international application.*

(a) Only residents or nationals of the United States of America may file international applications in the United States Receiving Office.

(b) Although the United States Receiving Office will accept international applications filed by any resident or national of the United States of America for international processing, an international application designating the United States of America will be accepted by the Patent and Trademark Office for the national stage only if filed by the inventor or as provided in §§ 1.422, 1.423 or 1.425.

(c) International applications which do not designate the United States of America may be filed by the assignee or owner.

(d) The attorney or agent of the applicant may sign the international application Request and file the international application for the applicant if the international application when filed is accompanied by a separate power of attorney to that attorney or agent from the applicant. The separate power of attorney from the applicant may be submitted after filing if sufficient cause is shown for not submitting it at the time of filing. Note that paragraph (b) of this section requires that the applicant be the inventor if the United States of America is designated.

(e) Any indication of different applicants for the purpose of different Designated Offices must be shown on the Request portion of the international application.

(f) Changes in the person, name, or address of the applicant of an international application shall be made in accordance with PCT Rule 18.5.

33. By adding a new § 1.422 to read as follows:

§ 1.422 *When the inventor is dead.*

In case of the death of the inventor, the legal representative (executor, administrator, etc.) of the deceased inventor may file an international application which designates the United States of America.

34. By adding a new § 1.423 to read as follows:

§ 1.423 *When the inventor is insane or legally incapacitated.*

In case an inventor is insane or otherwise legally incapacitated, the legal representative (guardian, conservator, etc.) of such inventor may file an international application which designates the United States of America.

35. By adding a new § 1.424 to read as follows:

§ 1.424 *Joint Inventors.*

Joint inventors must jointly file an international application which designates the United States of America; the signature of either of them alone, or less than the entire number will be insufficient for an invention invented by them jointly, except as provided in § 1.425.

36. By adding a new § 1.425 to read as follows:

§ 1.425 *Filing by other than inventor.*

(a) If a joint inventor refuses to join in an international application which designates the United States of America or cannot be found or reached after diligent effort, the international application which designates the United States of America may be filed by the other inventor on behalf of himself or herself and the omitted inventor. Such an international application which designates the United States of America must be accompanied by proof of the pertinent facts and must state the last known address of the omitted inventor. The Patent and Trademark Office shall forward notice of the filing of the international application to the omitted inventor at said address.

(b) Whenever an inventor refuses to execute an international application which designates the United States of America, or cannot be found or reached after diligent effort, a person to whom the inventor has assigned or agreed in writing to assign the invention or who otherwise shows sufficient proprietary interest in the matter justifying such action may file the international application on behalf of and as agent for the inventor. Such an international application which designates the United States of America, must be accompanied by proof of the pertinent facts and a showing that such action is necessary to preserve the rights of the parties or to prevent irreparable damage, and must state the last known address of the inventor. The assignment, written agreement to assign or other evidence of proprietary interest, or a verified copy thereof, must be filed in the Patent and Trademark Office. The Office shall forward notice of the filing of the application to the inventor at the address stated in the application.

37. By adding a new § 1.431 to read as follows:

§ 1.431 *International application requirements.*

(a) An international application shall contain, as specified in the Treaty and the Regulations, a Request, a description, one or more claims, an abstract, and one or more drawings (where required). (PCT Art. 3(2) and Section 207 of the Administrative Instruction.)

(b) An international filing date will be accorded by the United States Receiving Office, at the time of receipt of the international application, provided that:

(1) The applicant is a United States resident or national (35 U.S.C. 361(a), PCT Art. 11(1)(i)).

(2) The international application is in the English language (35 U.S.C. 361(c), PCT Art. 11(1)(ii)).

(3) The international application contains at least the following elements (PCT Art. 11(1)(iii)):

(i) an indication that it is intended as an international application (PCT Rule 4.2);

(ii) the designation of at least one Contracting State of the International Patent Cooperation Union;

(iii) the name of the applicant, as prescribed (note § 1.422);

(iv) a part which on the face of it appears to be a description; and

(v) a part which on the face of it appears to be a claim.

(c) Payment of the basic portion of the international fee (PCT Rule 15.2) and the transmittal and search fees (§ 1.445) shall be made in full at the time the international application papers required by paragraph (b) of this section are deposited. Failure to make full payment on the same date as the deposit of the international application papers required by subparagraph (b) of this section will result in the international application being considered withdrawn (PCT Art. 14(3)(a)).

38. By adding a new § 1.432 to read as follows:

§ 1.432 *Designation of States and payment of designation fees.*

(a) The names of Designated States shall appear in the Request upon filing and must be indicated as set forth in Section 201 of the Administrative Instructions.

(b) The designation fees may be paid upon filing of the international application, but must be paid at the latest before the expiration of one year from the priority date (PCT Rule 15.4(b)). Failure to timely pay the designation fee for a particular Designated State will result in the withdrawal of that designation (PCT Art. 14(3)(b)). Failure to timely pay at least one designation fee will result in the withdrawal of the international application (PCT Art. 14(3)(a)).

39. By adding a new § 1.433 to read as follows:

§ 1.433 *Physical requirements of international application.*

(a) The international application and each of the documents that may be referred to in the check list of the Request (PCT Rule 3.3(a)(ii)) shall be filed in one copy only.

(b) All sheets of the international application must be on A4 size paper (21.0 x 29.7 cm.).

(c) Other physical requirements for international applications are set forth in PCT Rule 11 and Sections 201–207 of the Administrative Instructions.

40. By adding a new § 1.434 to read as follows:

§ 1.434 *The Request.*

(a) The Request shall be made on a standardized printed form (PCT Rules 3 and 4). Copies of such printed Request

forms are available from the Patent and Trademark Office. Letters requesting such forms should be marked "Box PCT."

(b) The Check List portion of the Request form should indicate each document accompanying the international application on filing.

(c) All information, for example, addresses, names of States and dates, shall be indicated in the Request as required by PCT Rule 4 and Administrative Instructions 110 and 201.

(d) International applications which designate the United States of America shall include:

(1) The name, address and signature of the inventor, except as provided by §§ 1.421(d), 1.422, 1.423 and 1.425;

(2) A reference to any copending national application or international application designating the United States of America, if the benefit of the filing date for the prior copending application is to be claimed.

41. By adding a new § 1.435 to read as follows:

§ 1.435 *The description.*

(a) Requirements as to the content and form of the description are set forth in PCT Rules 5, 9, 10 and 11 and Administrative Instruction 204, and shall be adhered to.

(b) In international applications designating the United States the description must contain upon filing an indication of the best mode contemplated by the inventor for carrying out the claimed invention.

42. By adding a new § 1.436 to read as follows:

§ 1.436 *The claims.*

The requirements as to the content and format of claims are set forth in PCT Art. 6 and PCT Rules 6, 9, 10 and 11 and shall be adhered to. The number of the claims shall be reasonable, considering the nature of the invention claimed.

43. By adding a new § 1.437 to read as follows:

§ 1.437 *The drawings.*

(a) Subject to paragraph (b) of this section, when drawings are necessary for the understanding of the invention, or are mentioned in the description, they must be part of an international application as originally filed in the United States Receiving Office in order to maintain the international filing date during the national stage (PCT Art. 7).

(b) Drawings missing from the application upon filing will be accepted if such drawings are received within 30 days of the date of first receipt of the incomplete papers. If the missing drawings are received within the 30-day period, the international filing date shall be the date on which such drawings are received. If such drawings are not timely received, all references to drawings in the international application shall be considered non-existent (PCT Art. 14(2), Administrative Instruction 310).

(c) The physical requirements for drawings are set forth in PCT Rule 11 and shall be adhered to.

44. By adding a new § 1.438 to read as follows:

§ 1.438 *The abstract.*

(a) Requirements as to the content and form of the abstract are set forth in PCT Rule 8, and shall be adhered to.

(b) Lack of an abstract upon filing of an international application will not affect the granting of a filing date. However, failure to furnish an abstract within one month from the date of the notification by the Receiving Office will result in the international application being declared withdrawn.

45. By adding a new § 1.445 to read as follows:

§ 1.445 *International application filing and processing fees.*

(a) The following fees and charges are established by the Patent and Trademark Office under the authority of 35 U.S.C. 376:

(1) A transmittal fee (see 35 U.S.C. 361(d) and PCT Rule 14)------ $35.00

(2) A search fee (see 35 U.S.C. 361(d) and PCT Rule 16)------ $300.00

(3) A supplemental search fee when required (see PCT Art. 17(3)(a) and PCT Rule 40.2)-------- $200.00 per additional invention.

(4) The national fee, that is, the amount set forth as the filing fee under 35 U.S.C. 41(a)(1).

(5) A special fee when required (see 35 U.S.C. 372(c))------ $10.00 per claim.

(b) The basic fee and designation fee portions of the international fee shall be as prescribed in PCT Rule 15.

46. By adding a new § 1.446 to read as follows:

§ 1.446 *Refund of international application filing and processing fees.*

(a) Money paid for international application fees, where paid by actual mistake or in excess, such as a payment not required by law or Treaty and its Regulations, will be refunded.

(b) Refunds of a portion of the search fee may be made if the international search report is wholly or partly based on an earlier international or international-type search (PCT Rules 16 and 41). The amount of the refund will be as determined by the examiner according to the value of the prior international-type search or international search as 90%, 45% or 0% of the international search fee. If the amount of the refund is not a multiple of $5.00, it will be rounded to the next higher multiple of $5.00. See § 1.26 for refund of a portion of the international search fee during subsequent national examination of the application.

(c) Refund of the supplemental search fees will be made if such refund is determined to be warranted by the Commmissioner or the Commissioner's designee acting under PCT Rule 40.2(c).

(d) The international and search fees will be refunded if no international filing date is accorded (PCT Rules 15.6 and 16.2).

47. By adding a new § 1.451 to read as follows:

§ 1.451 *The priority claim and priority document in an international application.*

(a) The claim for priority must be made on the Request (PCT Rule 4.10) in a manner complying with Section 110 and 201 of the Administrative Instructions.

(b) Whenever the priority of an earlier United States national application is claimed in an international application, the applicant may request in a letter of transmittal accompanying the international application upon filing with the United States Receiving Office, that the Patent and Trademark Office prepare a certified copy of the national application for transmittal to the International Bureau (PCT Art. 8 and PCT Rule 17). The fee for preparing a certified copy is stated in § 1.21(b) and 35 U.S.C. 41(11).

(c) If a certified copy of the priority document is not submitted together with the international application on filing, or, if the priority application was filed in the United States and a request and appropriate payment for preparation of such a certified copy do not accompany the international application on filing, the certified copy of the priority document must be transmitted directly by the applicant to the International Bureau within the time limit specified in PCT Rule 17.1(a).

48. By adding a new § 1.455 to read as follows:

§ 1.455 *Representation in international applications.*

(a) Applicants of international applications may be represented by attorneys or agents licensed to practice before the Patent and Trademark Office or by a common representative (PCT Art. 49, Rules 4.8 and 90 and § 1.341).

(b) Appointment of an agent, attorney or common representative (PCT Rule 4.8) must be effected either in the Request form, signed by all applicants, or in a separate power of attorney submitted either to the United States Receiving Office or to the International Bureau.

(c) Powers of attorney and revocations thereof should be submitted to the United States Receiving Office until the issuance of the international search report.

(d) The addressee for correspondence will be as indicated in Section 108 of the Administrative Instructions.

49. By adding a new § 1.461 to read as follows:

§ 1.461 *Procedures for transmittal of record copy to the International Bureau.*

(a) Transmittal of the record copy of the international application to the International Bureau shall be made, at the

option of the applicant, either by the United States Receiving Office or by the applicant. Subject to paragraph (b) of this section, any applicant who chooses to make such transmittal personally shall notify the United States Receiving Office to that effect in writing, by way of a notice filed together with the international application. Such notice shall also state whether the applicant wishes to collect the record copy at the United States Receiving Office or to have the record copy mailed directly to him. The record copy of an international application which was filed without being accompanied by such notice will be transmitted to the International Bureau by the United States Receiving Office (PCT Rule 22).

(b) An applicant may transmit the record copy to the International Bureau as provided in PCT Rule 22.2 only if the international application is filed with the United States Receiving Office before the expiration of 11 months from the priority date.

(c) No copy of an international application may be transmitted to the International Bureau, a foreign Designated Office, or other foreign authority by the United States Receiving Office or the applicant, unless the applicable requirements of Part 5 of this chapter have been satisfied.

50. By adding a new § 1.465 to read as follows:

§ 1.465 *Timing of application processing based on the priority date.*

(a) For the purpose of computing time limits under the Treaty, the priority date shall be defined as in PCT Art. 2(xi).

(b) When a claimed priority date is cancelled under PCT Rule 4.10(d) or considered not to have been made under PCT Rule 4.10(b), the priority date for the purposes of computing time limits will be the date of the earliest valid remaining priority claim of the international application, or if none, the international filing date.

(c) When corrections under PCT Art. 11(2), Art. 14(2) or PCT Rule 20.2(a)(i) or (iii) are timely submitted, and the date of receipt of such corrections falls later than one year from the claimed priority date or dates, the Receiving Office shall proceed under PCT Rule 4.10(d).

51. By adding a new § 1.468 to read as follows:

§ 1.468 *Delays in meeting time limits.*

Delays in meeting time limits during international processing of international applications may only be excused as provided in PCT Rule 82. For delays in meeting time limits in a national application, see § 1.137.

52. By adding a new § 1.471 to read as follows:

§ 1.471 *Corrections and amendments during international processing.*

(a) All corrections submitted to the United States Receiving Office must be in the form of replacement sheets and be accompanied by a letter that draws attention to the differences between the replaced sheets and the replacement sheets, except that the deletion of lines of text, the correction of simple typographical errors, and one addition or change of not more than five words per sheet may be stated in a letter and the United States Receiving Office will make the deletion or transfer the correction to the international application, provided that such corrections do not adversely affect the clarity and direct reproducibility of the application (PCT Rule 26.4).

(b) Amendments of claims submitted to the International Bureau shall be as prescribed by PCT Rule 46.

53. By adding a new § 1.475 to read as follows:

§ 1.475 *Changes in person, name, or address of applicants and inventors.*

All requests for a change in person, name or address of applicants and inventor should be sent to the United States Receiving Office until the time of issuance of the international search report. Thereafter requests for such changes should be submitted to the International Bureau.

54. By adding § 1.481 to read as follows:

§ 1.481 *Determination of unity of invention before the International Searching Authority.*

(a) Before establishing the international search report, the International Searching Authority shall determine whether the international application complies with the requirement of unity of invention as set forth in PCT Rule 13 and as set forth in §§ 1.141 and 1.146 except as modified below in this section.

(b) If the International Searching Authority considers that the international application does not comply with the requirements of unity of invention, it shall inform the applicant accordingly and invite the payment of additional fees (note § 1.445 and PCT Art. 17(3)(a) and PCT Rule 40). The applicant will be given a time period in accordance with PCT Rule 40.3 to pay the additional fees due.

(c) In the case of non-compliance with unity of invention and where no additional fees are paid, the international search will be performed on the invention first mentioned ("main invention") in the claims.

(d) Lack of unity of invention may be directly evident before considering the claims in relation to any prior art, or after taking the prior art into consideration, as where a document discovered during the search shows the invention claimed in a generic or linking claim lacks novelty or is clearly obvious, leaving two or more claims joined thereby without a common inventive concept. In such a case the International Searching Authority may raise the objection of lack of unity of invention.

55. By adding § 1.482 to read as follows:

§ 1.482 *Protest to lack of unity of invention.*

(a) If the applicant disagrees with the holding of lack of unity of invention by the International Searching Authority, additional fees may be paid under protest, accompanied by a request for refund and a statement setting forth reasons for disagreement or why the required additional fees are considered excessive, or both (PCT Rule 40.2(c)).

(b) Protests under paragraph (c) of this section will be examined by the Commissioner or the Commissioner's designee. In the event that the applicant's protest is determined to be justified, the additional fees or a portion thereof will be refunded.

(c) An applicant who desires that a copy of the protest and the decision thereon accompany the international search report when forwarded to the Designated Offices, may notify the International Searching Authority to that effect any time prior to the issuance of the international search report. Thereafter, such notification should be directed to the International Bureau (PCT Rule 40.2(c)).

56. By adding a new § 3.56 to read as follows:

§ 3.56 *Oath to be filed with United States Designated Office under 35 U.S.C. 371(c)(4).*

As a below named inventor, being duly sworn (or affirmed), I depose and say that:

My residence, post office address and citizenship are as stated below next to my name;

I verily believe I am the original, first and sole inventor (if only one name is listed below) or a joint inventor (if plural inventors are named below) of the invention entitled: _____ described and claimed in international application number_____ filed _____, and as amended on _____ (if any), which I have reviewed and for which I solicit a patent:

I do not know and do not believe the same was ever known or used in the United States of America before my or our invention thereof, or patented or described in any printed publication in any country before my or our invention thereof or more than one year prior to my international application, that the same was not in public use or on sale in the United States of America more than one year prior to my international application, that the invention has not been patented or made the subject of an inventor's certificate issued before the date of my international application in any country foreign to the United States of America on an application filed by me or my legal representatives or assigns more than twelve months prior to my international application, that I acknowledge my duty to disclose information of which I am aware which is material to the examination of this application, and that no application for patent or inventor's certificate on this invention has been filed in any country foreign to the United

States of America prior to this application by me or my legal representatives or assigns except as follows: _____

_____

_____

(Full name of sole or first inventor)

_____ Date _____

(Inventor's signature)

_____

(Residence)

_____

(Citizenship)

_____

(Post Office Address)

_____

_____

(Full name of second joint inventor, if any)

_____ Date _____

(Inventor's signature)

_____

(Residence)

_____

(Citizenship)

_____

(Post Office Address)

_____

(Supply similar information and signature for third and subsequent joint inventors)

_____ }
_____ } ss:

Sworn to and subscribed before me this _____ day of _____, 19___.

_____

(Signature of notary or officer)

[SEAL]

_____

(Official character)

57. By adding a new § 3.57 to read as follows:

§ 3.57 *Declaration to be filed with United States Designated Office under 35 U.S.C. 371(c)(4).*

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name;

I verily believe I am the original, first and sole inventor (if only one name is listed below) or a joint inventor (if plural inventors are named below) of the invention entitled: _____ described and claimed in international application number _____ filed _____ and as amended on _____ (if any), which I have received and for which I solicit a patent:

I do not know and do not believe the same was ever known or used in the United States of America before my or our invention thereof, or patented or described in any printed publication in any country before my or our invention thereof or more than one year prior to my international application, that the same was not in public use or on sale in the United States of America more than one year prior to my international application, that the invention has not been patented or made the subject of an inventor's certificate issued before the date of my international application in any country foreign to the United States of America on an application filed by me or my legal representatives or assigns more than twelve months prior to my international application, that I acknowledge my duty to disclose information of which I am aware which is material to the examination of this application, and that no application for patent or inventor's certificate on this invention has been filed in any country foreign to the United States of America prior to this application by me or my legal representatives or assigns, except as follows: _____

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

_____

(Full name of sole or first inventor)

_____ Date _____

(Inventor's signature)

_____

(Residence)

_____

(Citizenship)

_____

(Post Office Address)

_____

_____

(Full name of second joint Inventor, if any)

_____ Date _____

(Second Inventor's signature)

_____

(Residence)

_____

(Citizenship)

_____

(Post Office Address)

_____

(Supply similar information and signature for third and subsequent joint inventors)

58. By revising § 5.1 to read as follows:

§ 5.1 *Defense inspection of certain applications.*

(a) The provisions of this part shall apply to both national and international applications filed in the Patent and Trademark Office and, with respect to inventions made in the United States, to applications filed in any foreign country or any international authority other than the United States Receiving Office. The (1) filing of a national or an international application in a foreign country or with an international authority other than the United States Receiving Office, or (2) transmittal of an international application to a foreign agency or an international authority other than the United States Receiving Office is considered to be a foreign filing within the meaning of Chapter 17 of Title 35, United States Code.

(b) In accordance with the provisions of 35 U.S.C. 181, patent applications containing subject matter the disclosure of which might be detrimental to the national security are made available for inspection by defense agencies as specified in said section. Only applications obviously relating to national security, and applications within fields indicated to the Patent and Trademark Office by the defense agencies as so related, are made available. The inspection will be made only by responsible representatives authorized by the agency to review applications. Such representatives are required to sign a dated acknowledgement of access accepting the condition that information obtained from the inspection will be used for no purpose other than the administration of 35 U.S.C. 181–188. Copies of applications may be made available to such representatives for inspection outside the Patent and Trademark Office under conditions assuring that the confidentiality of the applications will be maintained, including the conditions that: (a) all copies will be returned to the Patent and Trademark Office promptly if no secrecy order is imposed, or upon rescission of such order if one is imposed, and (b) no additional copies will be made by the defense agencies. A record of the removal and return of copies made available for defense inspection will be maintained by the Patent and Trademark Office. Applications relating to atomic energy are made available to the Department of Energy as specified in § 1.14 of this chapter.

59. By revising § 5.3 to read as follows:

§ 5.3 *Prosecution of application under secrecy order; withholding patent.*

Unless specifically ordered otherwise, action on the application by the Office and prosecution by the applicant will proceed during the time an application is under secrecy order to the point indicated in this section:

(a) National applications under secrecy order which come to a final rejection must be appealed or otherwise prosecuted to avoid abandonment. Appeals in such cases must be completed by the applicant but unless otherwise specifically ordered by the Commissioner will not be set for hearing until the secrecy order is removed.

(b) An interference will not be declared involving national applications under secrecy order. However, if an applicant whose application under secrecy order copies claims from an issued patent, a notice of that fact will be placed in the file wrapper of the patent.

(c) When the national application is found to be in condition for allowance except for the secrecy order the applicant and the agency which caused the secrecy order to be issued will be notified. This notice (which is not a notice of allowance under § 1.311 of this chapter) does not require response by the applicant and places the national application in a condition of suspension until the secrecy order is removed. When the secrecy order is removed the Patent and Trademark Office will issue a notice of allowance under § 1.311 of this chapter, or take such other action as may then be warranted.

(d) International applications under secrecy order will not be mailed, delivered or otherwise transmitted to the international authorities or the applicant. International applications under secrecy order will be processed up to the point where, if it were not for the secrecy order, record and search copies would be transmitted to the international authorities or the applicant.

60. Section 5.11 text and heading are revised to read as follows:

§ 5.11 *License for filing application in foreign country or for transmitting international application.*

(a) When no secrecy order has been issued under § 5.2, a license from the Commissioner of Patents and Trademarks under 35 U.S.C. 184 is required before filing any application for patent or for the registration of a utility model, industrial design, or model, in a foreign country, or transmitting an international application to any foreign patent agency or any international agency other than the United States Receiving Office, or causing or authorizing such filing or transmittal, with respect to an invest ment made in the United States, if:

(1) The foreign application is to be filed or its filing caused or authorized before a national or international application for patent is filed in the United States, or

(2) The foreign application is to be filed, or its filing caused or authorized, or the transmittal of the international application is caused or authorized, prior to the expiration of six months from the filing of the application in the United States.

(b) When there is no secrecy order in effect, a license under 35 U.S.C. 184 is not required if:

(1) The invention was not made in the United States, or

(2) The foreign application is to be filed or the international application is to be transmitted, or its filing or transmittal caused or authorized, after the expiration of six months from the filing of the national application in the United States.

(c) When a secrecy order has been issued under § 5.2, an application cannot be filed in a foreign country, nor can an international application be transmitted to any agency other than the United States Receiving Office except in accordance with § 5.5.

61. By revising text of heading of § 5.13 to read as follows:

§ 5.13 *Petition for license; no corresponding application.*

Where there is no corresponding national or international application, the petition for license must be accompanied by a legible copy of the material upon which license is desired. This copy will be retained as a measure of the license granted. For assistance in the identification of the subject matter of each license so issued, it is suggested that the petition or requesting letter be submitted in duplicate and provide a title and other description of the material. The duplicate copy of the petition will be returned with the license or other action on the petition. Where an international application is being filed in the United States Receiving Office, the petition may accompany the international application.

62. By revising paragraphs (b) and (c) of § 5.14 to read as follows:

§ 5.14 *Petition for license; corresponding U.S. application.*

* * * * *

(b) Two or more United States applications should not be referred to in the same petition for license unless they are to be combined in the foreign or international application, in which event the petition should so state and the identification of each United States application should be in separate paragraphs.

(c) Where the application to be filed or transmitted abroad contains matter not disclosed in the United States application or applications, including the case where the combining of two or more United States applications introduces subject matter not disclosed in any of them, a copy of the application as it is to be filed in the foreign country or international application which is to be transmitted to a foreign international or national agency as it is to be filed in the Receiving Office must be furnished with the petition. If, however, all new matter in the foreign or international application to be filed is readily identifiable, the new matter may be submitted in detail and the remainder by reference to the pertinent United States application or applications.

63. By revising § 5.15(a) to read as follows:

§ 5.15 *Scope of license.*

(a) A license to file an application in a foreign country or transmit an international application to any foreign or international agency other than the United States Receiving Office, when granted, includes authority to forward all duplicate and formal papers to the foreign country or international agencies and to make amendments and take any action in the prosecution of the foreign or international application, provided subject matter additional to that covered by the license is not involved. In those cases in which no license is required to file the foreign application or transmit the international application, no license is required to file papers in connection with the prosecution of the foreign or international application not involving the disclosure of additional subject matter. Any paper filed abroad or with an international agency following the filing of a foreign or international application which involves the disclosure of additional subject matter must be separately licensed in the same manner as a foreign or international application.

* * * * *

64. By revising § 5.17 to read as follows:

§ 5.17 *Who may use license.*

Licenses may be used by anyone interested in the foreign filing or international transmittal for or on behalf of the inventor or the inventor's assigns.

AUTHORITY: 35 U.S.C. 6, Public Law 94-131 (89 Stat. 685).

Date: April 25, 1978.

LUTRELLE F. PARKER,
Acting Commissioner of Patents, and Trademarks.

Approved: May 5, 1978.

JORDAN J. BARUCH,
Assistant Secretary for Science and Technology.

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(94) PATENT COOPERATION TREATY (PCT) IMPLEMENTATION: INFORMATION FOR PROSPECTIVE APPLICANTS

International applications under the Patent Cooperation Treaty (PCT) may be filed with the Patent and Trademark Office beginning on 01 June 1978. In order to provide prospective applicants with information necessary for filing and to advise on the availability of various documents covering the requirements and procedures under the PCT, the following topics are included in this Notice:

I. Amendments to the Regulations under the Patent Cooperation Treaty.
II. Administrative Instructions under the Patent Cooperation Treaty.
III. Fees for the processing of International Applications.
IV. PCT Member States which may be designated in International Applications.
V. Availability of Documents concerning the Patent Cooperation Treaty.

A revision of pertinent parts of Title 37 of the Code of Federal Regulations incorporating changes necessary to implement the Patent Cooperation Treaty will be published in the near future.

TOPIC I: AMENDMENTS TO THE REGULATIONS UNDER THE PATENT COOPERATION TREATY (PCT)

The PCT Assembly at its first meeting on April 10–14, 1978 adopted several changes to the PCT Regulations. These changes are reproduced below so that prospective applicants who already have copies of the Treaty may incorporate the changes. To obtain copies of the Treaty, including the changes to the Regulations, see Topic V of this Notice.

AMENDMENTS TO THE REGULATIONS UNDER THE PATENT COOPERATION TREATY (PCT)

Adopted by the Assembly of the International Patent Cooperation (PCT) Union on April 14, 1978

TABLE OF AMENDMENTS

Rule 4.4(c)	Amended
Rule 4.10(d)	Amended
Rule 11.6(a)	Amended
Rule 11.6(b)	Amended
Rule 11.13(a)	Amended
Rule 15.2(a)	Amended
Rule 15.2(b)	Amended
Rule 32*bis*.1	New rule added
Rule 48.2(a)	Amended
Rule 48.3(c)	Amended
Rule 57.2(a)	Amended
Rule 57.2(b)	Amended
Rule 58.2	New rule added
Rule 58.3	New rule added
Rule 61.1(b)	Amended
Rule 74*bis*.1	New rule added
Rule 86.3(a)	Amended
Rule 86.3(b)	New rule added
Rule 86.4(a)	Amended
Rule 86.4(b)	New rule added

RULE 4

The Request (Contents)

4.4 *Names and Addresses*

(c) Addresses shall be indicated in such a way as to satisfy the customary requirements for prompt postal delivery at the indicated address and, in any case, shall consist of all the relevant administrative units up to, and including, the house number, if any. Where the national law of the designated State does not require the indication of the house number, failure to indicate such number shall have no effect in that State. It is recommended to indicate any telegraphic and teleprinter address and telephone number.

4.10 *Priority Claim*

(d) If the filing date of the earlier application as indicated in the request does not fall within the period of one year preceding the international filing date, the receiving Office, or, if the receiving Office has failed to do so, the International Bureau, shall invite the applicant to ask either for the cancellation of the declaration made under Article 8(1) or, if the date of the earlier application was indicated erroneously, for the correction of the date so indicated. If the applicant fails to act accordingly within 1 month from the date of the invitation, the declaration made under Article 8(1) shall be cancelled ex officio. The receiving Office effecting the correction or cancellation shall notify the applicant accordingly and, if copies of the international application have already been sent to the International Bureau and the International Searching Authority, that Bureau and that Authority. If the correction or cancellation is effected by the International Bureau, the latter shall notify the applicant and the International Searching Authority accordingly.

RULE 11

Physical Requirements of the International Application

11.6 *Margins*

(a) The minimum margins of the sheets containing the request, the description, the claims, and the abstract, shall be as follows:

top: 2 cm
left side: 2.5 cm
right side: 2 cm
bottom: 2 cm

(b) The recommended maximum, for the margins provided for in paragraph (a), is as follows:

top: 4 cm
left side: 4 cm
right side: 3 cm
bottom: 3 cm

11.13 *Special Requirements for Drawings*

(a) Drawings shall be executed in durable, black, sufficiently dense and dark, uniformly thick and well-defined, lines and strokes without colorings.

RULE 15

The International Fee

15.2 *Amounts*

(a) The amount of the basic fee shall be:

(i) if the international application contains not more than 30 sheets: US $165.00 or 300 Swiss francs.

(ii) if the international application contains more than 30 sheets: US $165.00 or 300 Swiss francs plus US $3.00 or 6 Swiss francs per sheet in excess of 30 sheets.

(b) The amount of the designation fee for each designated State or each group of designated States for which the same regional patent is sought shall be: US $40.00 or 80 Swiss francs.

RULE 32bis

Withdrawal of the Priority Claim

32*bis*.1 *Withdrawals*

(a) The applicant may withdraw the priority claim made in the international application under Article 8(1) at any time before the international publication of the international application.

(b) Where the international application contains more than one priority claim, the applicant may exercise the right provided for in paragraph (a) in respect of one or more or all of them.

(c) Where the withdrawal of the priority claim, or, in the case of more than one such claim, the withdrawal of any of them, causes a change in the priority date of the international application, any time limit which is computed from the original priority date and which has not already expired shall be computed from the priority date resulting from that change. In the case of the time limit of 18 months referred to in Article 21(2)(a), the International Bureau may nevertheless proceed with the international publication on the basis of the said time limit as computed from the original priority date if the withdrawal is effected during the period of 15 days preceding the expiration of that time limit.

(d) For any withdrawal under paragraph (a), the provisions of Rule 32.1(c) and (d) and Rule 74*bis*.1 shall apply *mutatis mutandis*.

RULE 48

International Publication

48.2 *Contents*

(a) The pamphlet shall contain:

(i) a standardized front page,

(ii) the description,

(iii) the claims,

(iv) the drawings, if any,

(v) subject to paragraph (g), the international search report or the declaration under Article 17(2)(a); the publication of the international search report in the pamphlet shall, however, not be required to include the part of the international search report which contains only matter referred to in Rule 43 already appearing on the front page of the pamphlet,

(vi) any statement filed under Article 19(1), unless the International Bureau finds that the statement does not comply with the provisions of Rule 46.4.

48.3 *Language*

(c) If the international application is published in a language other than English, the international search report

to the extent that it is published under Rule 48.2(a)(v), or the declaration referred to in Article 17(2)(a), and the abstract shall be published both in that language and in English. The translations shall be prepared under the responsibility of the International Bureau.

RULE 57

The Handling Fee

57.2. *Amount*

(a) The amount of the handling fee shall be US $50.00 or 96 Swiss francs augmented by as many times the same amount as the number of languages into which the international preliminary examination report must, in application of Article 36(2), be translated by the International Bureau.

(b) Where, because of a later election or elections, the international preliminary examination report must, in application of Article 36(2), be translated by the International Bureau into one or more additional languages, a supplement to the handling fee shall be payable and shall amount to US $50.00 or 96 Swiss francs for each additional language.

RULE 58

The Preliminary Examination Fee

58.2 *Failure to pay*

(a) Where the preliminary examination fee fixed by the International Preliminary Examining Authority under Rule 58.1(b) is not paid as required under that Rule, the International Preliminary Examining Authority shall invite the applicant to pay the fee or the missing part thereof within one month from the date of the invitation.

(b) If the applicant complies with the invitation within the prescribed time limit, the preliminary examination fee will be considered as if it had been paid on the due date.

(c) If the applicant does not comply with the invitation within the prescribed time limit, the demand shall be considered as if it had not been submitted.

58.3 *Refund*

The International Preliminary Examining Authorities shall inform the International Bureau of the extent, if any, to which, and the conditions, if any, under which, they will refund any amount paid as a preliminary examination fee where the demand is considered as if it had not been submitted under Rule 57.4(c), Rule 58.2(c) or Rule 60.1(c), and the International Bureau shall promptly publish such information.

RULE 61

Notification of the Demand and Elections

61.1 *Notifications to the International Bureau, the Applicant, and the International Preliminary Examining Authority*

(b) The International Preliminary Examining Authority shall promptly inform the applicant in writing of the date of receipt of the demand. Where the demand has been considered under Rules 57.4(c), 58.2(c) or 60.1(c) as if it had not been submitted, the International Preliminary Examining Authority shall notify the applicant accordingly.

RULE 74bis

Notification of Withdrawal under Rule 32

74bis.1 *Notification of the International Preliminary Examining Authority*

If, at the time of the withdrawal of the international application or of the designation of all designated States under Rule 32.1, a demand for international preliminary examination has already been submitted and the international preliminary examination report has not yet issued, the International Bureau shall promptly notify the fact of withdrawal, together with the date of receipt of the notice effecting withdrawal, to the International Preliminary Examining Authority.

RULE 86

The Gazette

86.3 *Frequency*

(a) Subject to paragraph (b), the Gazette shall be published once a week.

(b) For a transitional period after the entry into force of the Treaty terminating upon a date fixed by the Assembly, the Gazette may be published at such times as the Director General considers appropriate having regard to the number of international applications and the amount of other material required to be published.

86.4 *Sale*

(a) Subject to paragraph (b), the subscription and other sale prices of the Gazette shall be fixed in the Administrative Instructions.

(b) For a transitional period after the entry into force of the Treaty terminating upon a date fixed by the Assembly, the Gazette may be distributed on such terms as the Director General considers appropriate having regard to the number of international applications and the amount of other material published therein.

TOPIC II: ADMINISTRATIVE INSTRUCTIONS UNDER THE PATENT COOPERATION TREATY

The Administrative Instructions have been established under Article 58(4) and Rule 89 of the Patent Cooperation Treaty by the Director General of the World Intellectual Property Organization and will enter into force on 01 June 1978. The Administrative Instructions comprise 6 parts and a number of Annexes which provide instructions on various processing requirements that are not covered in detail in the Treaty or its Regulations.

A draft of the Administrative Instructions was published in the January 25, 1977 issue of the OFFICIAL GAZETTE (954 O.G. 4, 1362–1411). A number of changes to that draft version have been made and appear in the established final version printed in this Notice. Among these changes are included a renumbering of many sections, establishment of final wording for sections that were marked in the draft as tentative, and changes in the Request and International Search Report forms.

The Administrative Instructions printed in this Notice contain the entirety of Parts 1–6, and the full text of Annexes A–E. Annex F, which contains model copies of all forms for use by International Authorities (over 300 pages), has not been reproduced in full. However, that portion of Annex F containing copies of the four printed forms for use by applicants and Authorities has been reproduced.

From time to time the Administrative Instructions will be amended. Such amendments, and their effective dates, will be published in the OFFICIAL GAZETTE. For the availability of individual copies of the Administrative Instructions and the Request form see Topic V of this Notice.

ADMINISTRATIVE INSTRUCTIONS UNDER THE PATENT COOPERATION TREATY (PCT)

TABLE OF CONTENTS

Part 1: Instructions Relating to General Matters

Section 101: Abbreviated Expressions
Section 102: Use of the Forms
Section 103: Languages of the Forms
Section 104: Language of Correspondence from the Applicant
Section 105: Several Applicants
Section 106: Common Agent for Several Applicants
Section 107: Identification of International Authorities
Section 108: Correspondence Intended for the Applicant
Section 109: Notification of Authorization or Refusal of Rectification
Section 110: Dates

Part 2: Instructions Relating to the International Application

Section 201: Names of States; Cancellation of Designations
Section 202: Kind of Protection
Section 203: Regional Patents
Section 204: Headings of the Parts of the Description
Section 205: Numbering of Claims upon Amendment
Section 206: Common Representative Designated in the Request
Section 207: Arrangement of Elements and Numbering of Sheets of the International Application

Part 3: Instructions Relating to the Receiving Office

Section 301: Notification of Receipt of Purported International Application
Section 302: Notification of Priority Claim Considered Not To Have Been Made
Section 303: Deletion of Additional Matter in the Request
Section 304: Corrections Submitted to the Receiving Office Concerning Expressions, Etc., Not To Be Used in the International Application
Section 305: Identifying the Copies of the International Application
Section 306: Change in the Person, Name or Address of the Applicant
Section 307: System of Numbering International Applications
Section 308: Marking of the Sheets of the International Application
Section 309: Procedure in the Case of Later Submitted Sheets
Section 310: Procedure in the Case of Missing Drawings
Section 311: Renumbering of Sheets of the International Application
Section 312: Notification of Decision Not To Issue Declaration that the International Application is Considered Withdrawn
Section 313: Manner of Making the Necessary Annotations in the Check List
Section 314: Manner of Indicating Correction of the Priority Date or Cancellation of the Priority Claim
Section 315: Notification of Non-Collection of Record Copy
Section 316: Procedure in the Case Where the International Application Lacks the Prescribed Signature

Part 4: Instructions Relating to the International Bureau

Section 401: Marking of Sheets of the Record Copy
Section 402: Notification of Correction of the Priority Date or Cancellation of the Priority Claim
Section 403: Transmittal of Protest Against Payment of Additional Fee and Decision Thereon
Section 404: International Publication Number
Section 405: Special Publication Fee
Section 406: Pamphlets
Section 407: The Gazette
Section 408: Priority Application Number
Section 409: Notifications of Priority Claim Considered Not To Have Been Made
Section 410: Numbering of Sheets of the International Application For Purposes of International Publication
Section 411: Notification that the Certified Copy of the Priority Document Has Not Been Submitted

Part 5: Instructions Relating to the International Searching Authority

Section 501: Corrections Submitted to the International Searching Authority Concerning Expressions, Etc., Not To Be Used in the International Application
Section 502: Protest Against Payment of Additional Fee and Decision Thereon
Section 503: Method of Identifying Documents Cited in the International Search Report
Section 504: Classification of the Subject Matter of the International Application
Section 505: Indication of Citations of Particular Relevance in the International Search Report
Section 506: Comments on Draft Translation of the International Application
Section 507: Manner of Indicating Certain Special Categories of Documents Cited in the International Search Report
Section 508: Manner of Indicating the Claims to which the Documents Cited in the International Search Report are Relevant

Part 6: Instructions Relating to the International Preliminary Examining Authority

Section 601: Determination Whether Applicant is Entitled To Make a Demand
Section 602: Marking of Replacement Sheets and Renumbering of Sheets of the International Application
Section 603: Transmittal of Protest Against Payment of Additional Fee and Decision Thereon
Section 604: Guidelines for Explanations Contained in the International Preliminary Examination Report

Annex A: Names of States (Members of the Paris Union)

Annex B: Code for Identifying States and Organizations

Annex C: Standard Code for Identification of Different Kinds of Patent Documents

Annex D: Information from Pamphlet Front Page To Be Included in the Gazette under Rule 86.1(i)

Annex E: Information To Be Published in the Gazette under Rule 86.1(v)

Annex F: Forms

PART 1

INSTRUCTIONS RELATING TO GENERAL MATTERS

Section 101

Abbreviated Expressions

In these Administrative Instructions:

(i) "Treaty" means the Patent Cooperation Treaty;

(ii) "Regulations" means the Regulations under the Treaty;

(iii) "Article" means an Article of the Treaty;

(iv) "Rule" means a Rule of the Regulations;

(v) "International Bureau" means the International Bureau as defined in Article 2 (xix) of the Treaty;

(vi) "International Authorities" means the receiving Offices, the International Searching Authorities, the International Preliminary Examining Authorities, and the International Bureau.

Section 102

Use of the Forms

(a) The forms annexed to these Administrative Instructions as *Annex F** (hereinafter referred to as "the Forms") are part of these Administrative Instructions.

(b) Subject to paragraph *(c)*, the International Authorities shall use, or require the use of, the mandatory forms specified below:

Forms Required to be Printed under, or Otherwise Provided for, in the Regulations

PCT/RO/101 — Request (including the fee calculation sheet annexed thereto)
PCT/ISA/210 — International Search Report
PCT/IPEA/401 — Demand
PCT/IPEA/409 — International Preliminary Examination Report

Forms for Use by the International Bureau

Forms PCT/IB/301 to 345, with the exception of Form PCT/IB/328.

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* This Annex is published separately; it may be obtained from the International Bureau, upon request, at a price of 40 Swiss francs.

Other Forms

PCT/RO/103**	PCT/ISA/201**	PCT/IPEA/405**
PCT/RO/104*	PCT/ISA/202*	PCT/IPEA/407*
PCT/RO/106*	PCT/ISA/203*	PCT/IPEA/408**
PCT/RO/109*	PCT/ISA/205*	PCT/IPEA/410*
PCT/RO/111*	PCT/ISA/206**	PCT/IPEA/412*
PCT/RO/112*	PCT/ISA/209*	PCT/IPEA/414*
PCT/RO/113*	PCT/ISA/212**	PCT/IPEA/415*
PCT/RO/114*	PCT/ISA/214*	PCT/IPEA/418*
PCT/RO/115**	PCT/ISA/215*	PCT/IPEA/419*
PCT/RO/116*	PCT/ISA/217*	PCT/IPEA/420**
PCT/RO/117*	PCT/ISA/218*	
PCT/RO/118*	PCT/ISA/219*	
PCT/RO/121*		
PCT/RO/123*		
PCT/RO/129*		
PCT/RO/130*		

(c) The obligation of the International Authorities to use, or require the use of, the mandatory Forms is subject to the following provisos:

(i) slight variations in layout necessary in view of the printing of such Forms in various languages are permitted;

(ii) in all Forms, other than those for the request, the international search report, the demand and the international preliminary examination report, slight variations in layout, to the extent necessary to meet the particular office requirements of the International Authorities, are permitted as well;

(iii) where the receiving Office, the International Searching Authority and/or the International Preliminary Examining Authority are each part of the same Office, the obligation to use the mandatory Forms does not extend to communications within that same Office;

(iv) the annexes to Forms PCT/RO/106, PCT/ISA/215 and PCT/IB/313 may be omitted in cases where they are not used;

(v) the mandatory character of the Forms referred to in paragraph *(b)* does not extend to the Notes attached to them.

(d) The use of Forms annexed to these Administrative Instructions other than those referred to in paragraph *(b)* is optional.

Section 103

Languages of the Forms

(a) The language of the Forms used by any receiving Office shall be the same as the language in which the international application is filed, provided that the receiving Office may, in its communications to the applicant, use any other language being one of its official languages.

(b) The language or languages of the Forms to be used by any International Searching Authority shall be specified in the applicable agreement referred to in Article 16(3)*(b)*.

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* Forms for use by receiving Offices, International Searching Authorities and International Preliminary Examining Authorities.

** Forms sent to applicants, on matters subject to review or further processing by International Authorities.

(c) The language or languages of the Forms to be used by any International Preliminary Examining Authority shall be specified in the applicable agreement referred to in Article 32(3).

(d) The language of any Form used by the International Bureau shall be English where the language of the international application is English, and it shall be French where the language of the international application is French. Where the language of the international application is neither English nor French, the language of any Form used by the International Bureau in its communications to any other International Authority shall be English or French according to the wishes of such Authority, and in its communications to the applicant it shall be English or French according to the wishes of the applicant.

Section 104

Language of Correspondence from the Applicant

(a) The language of any letter from the applicant to the receiving Office shall be the same as the language of the international application to which such letter relates. However, the receiving Office may expressly authorize the use of any other language.

(b) The language of any letter from the applicant to the International Bureau shall be English where the language of the international application is English, and it shall be French where the language of the international application is French. Where the language of the international application is neither English nor French, the language of any letter from the applicant to the International Bureau shall be English or French at the choice of the applicant.

Section 105

Several Applicants

Where any international application indicates as applicants several persons, it shall be sufficient, for the purpose of identifying that application, to indicate, in any Form or correspondence relating to such application, the name of the applicant first named in the request.

Section 106

Common Agent for Several Applicants

In the case of several applicants, any agent designated under Rule 4.7 in the request signed by all the applicants, or appointed under Rule 90.3 in a separate power of attorney signed by all the applicants, shall be considered a common agent.

Section 107

Identification of International Authorities

(a) Whenever the nature of any communication from or to the applicant or from or to any International Authority so permits, any International Authority may be indicated in the communication by the two-letter code as appearing in *Annex B*.

(b) Where the International Authority is a receiving Office, an International Searching Authority or an International Preliminary Examining Authority, indication thereof shall be preceded by the letters "RO," "ISA," or "IPEA," respectively, followed by a slant (e.g., "RO/JA," "ISA/US," "IPEA/SU").

Section 108

Correspondence Intended for the Applicant

(a) Any correspondence from an International Authority intended for the applicant, or, in the case of several applicants, the applicants, shall be addressed as follows:

(i) Where the applicant has designated or appointed one agent, correspondence shall be addressed to that agent. Where, in the case of several applicants, the applicants are represented by a common representative or a common agent, correspondence shall be addressed to that representative or that agent.

(ii) Where the applicant has designated several agents in the request, correspondence shall be addressed to the agent first mentioned therein. Where, in the case of several applicants, the applicants have designated several common agents in the request, correspondence shall be addressed to the common agent first mentioned therein.

(iii) Where the applicant has appointed several agents in one or more separate powers of attorney, correspondence shall be addressed to the agent first mentioned in the earliest filed and still valid separate power of attorney. Where, in the case of several applicants, the applicants have appointed several common agents in one or more separate powers of attorney, correspondence shall be addressed to the common agent first mentioned in the earliest filed and still valid separate power of attorney.

(b) Any correspondence from an International Authority to the applicant or his agent shall be marked with the file reference, composed either of letters or numbers, or both, of the applicant or the agent, if so indicated on the request Form, provided this reference does not exceed ten characters.

Section 109

Notification of Authorization or Refusal of Rectification

Any International Authority which authorizes or refuses rectification of obvious errors of transcription under Rule 91 shall promptly inform the applicant of such authorization or refusal and, in the case of refusal, of the reasons therefor.

Section 110

*Dates**

Any date in the international application, or used in any correspondence emanating from International Authorities relating to the international application, shall be indicated by the Arabic number of the day, by the name of the month, and by the Arabic number of the year. The receiving Office, where the applicant has not done so, or the International Bureau, where the applicant has not done so and the receiving Office fails to do so, shall, after or below any date indicated by the applicant in the request, repeat the date, in parenthesis, by indicating it by two-digit Arabic numerals each for the number of the day, for the number of the month and for the last two numbers of the year, in that order and with a period after the digit pairs of the day and of the month (for example, "30 March 1978 (30.03.78)").

* This system of indication of dates is based on the ICIREPAT standards whereas the ISO standards provide for the reverse sequence of data. If the use of the ISO standards should become more common practice in the industrial property field, this Section will be reviewed.

PART 2

INSTRUCTIONS RELATING TO THE INTERNATIONAL APPLICATION

Section 201

Names of States: Cancellation of Designations

(a) The name of any State referred to in the request shall be indicated either by the full name of the State or by a generally accepted short title which, if the indications are in English or French, shall be as appears in *Annex A*. The receiving Office, or the International Bureau where the receiving Office fails to do so, shall insert, in the appropriate space provided for in the request form, the two-letter country code as appears in *Annex B* (for example, where France is the third designated State in Box V of the request Form, "FR 3. France" or "FR 3. French Republic").

(b) The receiving Office shall cancel *ex-officio* the designation of States other than Contracting States, and inform the applicant promptly of such action.

Section 202

Kind of Protection

(a) Where the applicant wishes his application to be treated in any designated State as an application not for a patent but for the grant of another kind of protection referred to in Article 43, he shall make the indication in the request referred to in Rule 4.12*(a)* by inserting the words "inventor's certificate," "utility certificate," "utility model," "patent of addition," "certificate of addition," "inventor's certificate of addition" or "utility certificate of addition," or their equivalent in the language of the international application, immediately after the indication of the said State.

(b) Where the applicant is seeking two kinds of protection under Article 44, he shall make the indication in the request referred to in Rule 4.12*(b)* by inserting, immediately after the indication of the said State and in the language of the international application, either,

(i) any two of the following terms connected by the word "and": "patent," "inventor's certificate," "utility certificate," "utility model," "patent of addition," "certificate of addition," "inventor's certificate of addition," "utility certificate of addition;" or

(ii) any two of the terms indicated in (i) above, one of them preceded by the word "primarily" and the other by the word "subsidiarily."

Section 203

Regional Patents

Where the applicant wishes to obtain a regional patent in respect of any designated State, he shall make the indication in the request referred to in Rule 4.1*(b)* (iv) by inserting the words "regional patent," or their equivalent in the language of the international application, immediately after the indication of the said State or, where an indication has been made under Section 202, after that indication, provided that:

(i) where Article 4(1) (ii), third clause applies, and not all the States party to the regional treaty have been designated, the international application shall be treated as if all those States had

been designated and as if the designations of all such States contained the said words, whether the said designations contained an indication of the wish to obtain a regional patent or, according to Article 4(1) (ii), fourth clause, are to be treated as containing such indication;

(ii) where the national law of any designated State contains a provision as referred to in Article 45(2), the International Bureau shall, according to Article 4(1)(ii), fourth clause, treat the designation as if it contained the said words even where the applicant failed to indicate them.

Section 204

Headings of the Parts of the Description

The headings referred to Rule 5.1*(c)* should be as follows:

(i) for matter referred to in Rule 5.1*(a)*(i), "Technical Field;"

(ii) for matter referred to in Rule 5.1*(a)*(ii), "Background Art;"

(iii) for matter referred to in Rule 5.1*(a)*(iii), "Disclosure of Invention;"

(iv) for matter referred to in Rule 5.1*(a)*(iv), "Brief Description of Drawings;"

(v) for matter referred to in Rule 5.1*(a)*(v), "Best Mode for Carrying Out the Invention;"

(vi) for matter referred to in Rule 5.1*(a)*(vi), "Industrial Applicability."

Section 205

Numbering of Claims upon Amendment

(a) Any claim submitted after the filing date of the international application and which is not identical with the claims previously appearing in the international application shall, at the choice of the applicant, be submitted either:

(i) as an amended claim, in which case, it shall bear the same number as the previous claim it amends; that number shall be followed by the word "(amended)" or its equivalent in the language of the international application; or

(ii) as a new claim, in which case, it shall bear the next number after the highest previously numbered claim; that number shall be followed by the word "(new)" or its equivalent in the language of the international application.

(b) The deletion of any claim previously appearing in the international application shall be made by indicating the number of the previous claim followed by the word "(cancelled)" or its equivalent in the language of the international application.

Section 206

Common Representative Designated in the Request

If the applicants designate a common representative in accordance with Rule 4.8*(a)*, such common representative shall be indicated on the front page of the request Form. The indication of the common representative shall take the form of a statement designating the named applicant to act as the common representative on behalf of all the applicants.

Section 207

Arrangement of Elements and Numbering of Sheets of the International Application

(a) In effecting the sequential numbering of the sheets of the international application in accordance with Rule 11.7, the elements of the international application shall be placed in the following order: the request, the description, the claims, the abstract, the drawings.

(b) The sequential numbering of the sheets shall be effected by using three separate series of numbering, the first series applying to the request only and commencing with the first sheet of the request, the second series commencing with the first sheet of the description and continuing through the claims until the last sheet of the abstract, and the third series being applicable to the sheets of the drawings only and commencing with the first sheet of the drawings.

PART 3

INSTRUCTIONS RELATING TO THE RECEIVING OFFICE

Section 301

Notification of Receipt of Purported International Application

Any receiving Office may notify the applicant of the receipt of the purported international application. The notification should indicate the date of actual receipt, the international application number of the purported international application referred to in Section 307 and the applicant's file reference, where available, as well as, where useful for purposes of identification, the title of the invention.

Section 302

Notification of Priority Claim Considered Not To Have Been Made

Where, owing to failure to meet the requirements of Rule 4.10*(b)*, the priority claim is, for the purposes of procedure under the Treaty, considered not to have been made, the receiving Office shall indicate that fact in the international application by marking over the box in the request Form which provides for the information concerning the priority claim, the words "NOT TO BE CONSIDERED FOR PCT PROCEDURE" or its equivalent in the language of the international application. The receiving Office shall notify the applicant accordingly. If copies of the international application have already been sent to the International Bureau and the International Searching Authority, the receiving Office shall also notify that Bureau and that Authority.

Section 303

Deletion of Additional Matter in the Request

Where, under Rule 4.17*(b)*, the receiving Office deletes *ex-officio* any matter contained in the request, it shall do so by placing such matter between square brackets and entering the word "DELETED," or its equivalent in the language of the international application, in the right-

hand margin adjacent to the matter so placed between brackets, and shall notify the applicant accordingly. If copies of the international application have already been sent to the International Bureau and the International Searching Authority, the receiving Office shall also notify that Bureau and that Authority.

Section 304

Corrections Submitted to the Receiving Office Concerning Expressions, etc., not to be used in the International Application

Where the applicant submits corrections to the receiving Office aimed at complying with the prescriptions of Rule 9.1, that Office shall, if copies of the international application have not yet been transmitted to the International Bureau and the International Searching Authority, attach copies of such corrections to the international application. If copies of the international application have already been transmitted, the receiving Office shall transmit copies of such corrections to the said Bureau and the said Authority.

Section 305

Identifying the Copies of the International Application

(a) Where, under Rule 11.1*(a)*, the international application has been filed in one copy, the receiving Office shall, after preparing under Rule 21.1*(a)* the additional copies required under Article 12(1), mark,

(i) the words "RECORD COPY" in the upper left-hand corner of the first page of the original copy,

(ii) in the same space on one additional copy, the words "SEARCH COPY," and

(iii) in the same space on the other such copy, the words "HOME COPY," or their equivalent in the language of the international application.

(b) Where, under Rule 11.1*(b)*, the international application has been filed in more than one copy, the receiving Office shall choose the copy most suitable for reproduction purposes, and mark the words "RECORD COPY," in the upper left-hand corner of its first page. After verifying the identity of any additional copies and, if applicable, preparing under Rule 21.1*(b)* the home copy, it shall mark, in the upper left-hand corner of the first page of one such copy, the words "SEARCH COPY," and, in the same space on the other such copy, the words "HOME COPY," or their equivalent in the language of the international application.

Section 306

Change in the Person, Name or Address of the Applicant

Any request for the recording of any changes in the person or name of the applicant referred to in Rule 18.5 or Rule 54.4, or of any change in the address of the applicant shall be signed by the applicant or, if the receiving Office requested such change under Rule 18.5 or Rule 54.4, by the receiving Office. The request shall indicate the name or address of the applicant for which the change is requested.

Section 307

System of Numbering International Applications

Papers purporting to be an international application under Rule 20.1 shall be marked with the international application number, consisting of the letters "PCT," a slant, the two-letter code, as in *Annex B*, indicating the receiving Office, a two-digit indication of the last two numbers of the year in which such papers were first received, a slant and a five-digit number, allotted in sequential order corresponding to the order in which the international applications are received (e.g., "PCT/SU78/00001"). However, if a negative determination is made under Rule 20.7 or a declaration is made under Article 14(4), the letters "PCT" shall be deleted by the receiving Office from the indication of the international application number on any papers marked previously with that number, and the said number shall be used without such letters in any future correspondence relating to the purported international application.

Section 308

Marking of the Sheets of the International Application

(a) The receiving Office shall indelibly mark, so as to admit of direct reproduction in any of the manners set forth in Rule 11.2*(a)*, the international application number referred to in Section 307 in the upper right-hand corner of each sheet of each copy of the purported international application.

(b) The data to be indicated on any replacement sheet under Rule 26.4*(b)* shall be indelibly marked by the receiving Office, so as to admit of direct reproduction in any of the manners set forth in Rule 11.2*(a)*, in the upper right-hand corner of each replacement sheet.

Section 309

Procedure in the Case of Later Submitted Sheets

(a) The receiving Office shall indelibly mark, so as to admit of direct reproduction in any of the manners set forth in Rule 11.2*(a)*, any sheet received on a date later than the date on which sheets were first received with the date on which it received that sheet, inserted immediately below the international application number referred to in Section 307.

(b) The receiving Office shall, in the case of later submitted sheets received within the time limits referred to in Rule 20.2*(a)*(i) and (ii):

(i) effect the required correction of the international filing date, or, where no international filing date has yet been accorded, of the date of receipt of the purported international application;

(ii) notify the applicant of the correction effected under item (i) above;

(iii) where transmittals under Article 12(1) have already been made, notify the International Bureau and the International Searching Authority of any correction effected under item (i) above, by transmitting a copy of the corrected first page of the request, and forward copies of the later submitted sheets to the said Bureau and the said Authority;

(iv) where transmittals under Article 12(1) have not yet been made, attach a copy of the later submitted sheets to the record copy and the search copy.

(c) the receiving Office shall, in the case of later submitted sheets received after the expiration of the time limits referred to in Rule 20.2*(a)*(i) and (ii):

(i) notify the applicant of that fact and of the date of receipt of the later submitted sheets;

(ii) where transmittals under Article 12(1) have already been made, forward a copy of the later submitted sheets to the International Bureau with the indication that such sheets are not to be taken into consideration for the purposes of international processing;

(iii) where transmittals under Article 12(1) have not yet been made, attach a copy of the later submitted sheets to the record copy with the indication that such sheets are not to be taken into consideration for the purposes of international processing.

Section 310

Procedure in the Case of Missing Drawings

(a) Where the international application refers to drawings which in fact are not included in that application, the receiving Office shall make the indication referred to in Rule 26.6*(a)* by an appropriate marking of the request Form.

(b) Section 309*(a)* shall apply also in the case of drawings received by the receiving Office on a date later than the date on which sheets were first received by that Office.

(c) The receiving Office shall, in the case of missing drawings received within the time limit referred to in Rule 20.2*(a)*(iii):

(i) effect the required correction of the international filing date, or, where no international filing date has yet been accorded, of the date of receipt of the purported international application, and delete the indication made under paragraph *(a)* above;

(ii) notify the applicant of the correction effected under item (i), above;

(iii) where transmittals under Article 12(1) have already been made, notify the International Bureau and the International Searching Authority of any correction effected under item (i), above, by transmitting a copy of the corrected first page of the request, and forward copies of the later submitted drawings to the said Bureau and the said Authority;

(iv) where transmittals under Article 12(1) have not yet been made, attach a copy of the later submitted drawings to the record copy and the search copy.

(d) The receiving Office shall, in the case of missing drawings received after the expiration of the time limit referred to in Rule 20.2*(a)*(iii):

(i) notify the applicant of the fact and of the date of receipt of the later submitted drawings;

(ii) where transmittals under Article 12(1) have already been made, forward a copy of the later submitted drawings to the International Bureau with the indication that such drawings and any reference to such drawings are not to be taken into consideration for the purposes of international processing;

(iii) where transmittals under Article 12(1) have not yet been made, attach a copy of the later submitted drawings to the record copy with the indication that such drawings and any reference to such drawings are not to be taken into consideration for the purposes of international processing.

Section 311

Renumbering of Sheets of the International Application

(a) The receiving Office shall, subject to Section 207, sequentially renumber the sheets of the international application when necessitated by the addition of any new sheet, the deletion of entire sheets, a change in the order of the sheets or any other reason.

(b) The sheets of the international application shall be provisionally renumbered in the following manner:

(i) when a sheet is deleted, the receiving Office shall either include a blank sheet with the same number and with the word "deleted," or its equivalent in the language of the international application, below the number, or insert, in brackets, below the number of the following sheet, the number of the deleted sheet with the word "deleted" or its equivalent in the language of the international application;

(ii) when a sheet is substituted, the receiving Office shall write below the number of the new sheet the word "substitute" or its equivalent in the language of the international application;

(iii) when one or more sheets are added, each sheet shall be identified by the number of the preceding sheet followed by an oblique stroke and then by a natural number series, starting always with number one for the first sheet added after an unchanged sheet (e.g., 10/1, 15/1, 15/2, 15/3, etc.). When later additions of sheets to an existing series of added sheets are necessary, an extra digit shall be used for identifying the further additions (e.g., 15/1, 15/1/1, 15/1/2, 15/2, etc.).

(c) In the cases mentioned in (i) and (iii) above, it is recommended that the receiving Office should write, below the number of the last sheet, the total number of the sheets of the international application followed by the words "TOTAL OF SHEETS" or their equivalent in the language of the international application. It is further recommended that, at the bottom of any last sheet added, the words "LAST ADDED SHEET" or their equivalent in the language of the international application should be inserted.

Section 312

Notification of Decision not to Issue Declaration that the International Application is Considered Withdrawn

Where the receiving Office, after having notified the applicant under Rule 29.4 of its intent to issue a declaration under Article 14(4), decides not to issue such a declaration, it shall notify the applicant accordingly.

Section 313

Manner of Making the Necessary Annotations in the Check List

Where, under Rule 3.3*(b)*, the receiving Office itself fills in the check list, that Office shall mark, next to such check list, the words "FILLED IN BY RO," or their equivalent in the language of the international application. Where only some of the indications are filled in by the receiving Office, the said words and each indication filled in by that Office shall be identified by an asterisk.

Section 314

Manner of Indicating Correction of the Priority Date or Cancellation of the Priority Claim

(a) Where, under Rule 4.10*(d)*, the applicant corrects the erroneously indicated filing date of any earlier application, the receiving Office shall enter the corrected date in the request and draw a line through the previously entered date while still leaving it legible.

(b) Where, under Rule 4.10*(d)*, the receiving Office cancels the declaration made under Article 8(1), that Office shall mark over the said declaration the words "CANCELLED ON REQUEST OF APPLICANT" or "CANCELLED EX OFFICIO BY RO," or their equivalent in the language of the international application, as the case may be.

Section 315

Notification of Non-Collection of Record Copy

Where, under Rule 22.2*(d)*, the receiving Office has, in accordance with the applicant's wish, held the record copy at the disposal of the applicant, and the applicant has not collected that copy by the expiration of the time limit for receipt of that copy by the International Bureau, the receiving Office shall notify the applicant accordingly.

Section 316

Procedure in the Case where the International Application Lacks the Prescribed Signature

Where, under Article 14(1)*(a)*(i), the receiving Office finds that any international application is defective in that it lacks the prescribed signature, that Office shall send to the applicant, together with the invitation to correct under Article 14(1)*(b)*, a copy of the request part of the international application. The applicant shall, within the prescribed time limit, return said copy after affixing thereto the prescribed signature.

PART 4

INSTRUCTIONS RELATING TO THE INTERNATIONAL BUREAU

Section 401

Marking of Sheets of the Record Copy

The International Bureau shall, under Rule 24.1, mark the date of receipt of the record copy in the appropriate space on the request Form and place the stamp of the International Bureau in the lower right-hand corner of each sheet of the record copy.

Section 402

Notification of Correction of the Priority Date or Cancellation of the Priority Claim

Where, under Rule 4.10*(d)*, the correction of the priority date or the cancellation of the priority claim is effected by the International Bureau, the manner of indicating the correction or cancellation set forth in Section 314 shall apply *mutatis mutandis*. The receiving Office, in addition to the applicant and the International Searching Authority, shall be notified accordingly by the International Bureau.

Section 403

Transmittal of Protest Against Payment of Additional Fee and Decision Thereon

Where, under Rules 40.2*(c)* or 68.3*(c)*, the International Bureau receives a request from the applicant to forward to any designated or elected Office the texts of both the protest against payment of an additional fee and the decision thereon by the International Searching Authority or the International Preliminary Examining Authority, as the case may be, it shall proceed according to such request.

Section 404

International Publication Number

The International Bureau shall assign to each published international application an international publication number which shall be different from the international application number. The international publication number shall be used on the pamphlet and in the Gazette entry. It shall consist of the two-letter code "WO" followed by a two-digit designation of the last two numbers of the year of publication, a slant, and a serial number consisting of five digits (e.g., "WO78/12345").

Section 405

Special Publication Fee

The special publication fee provided for in Rule 48.4 shall be 200 Swiss francs.

Section 406

Pamphlets

(a) Pamphlets referred to in Rule 48.1 shall be published on a given day of each week.

(b) All pamphlets shall be of A4 size and shall be printed by offset, recto-verso.

(c) The form and particulars of the front page of each pamphlet shall be decided by the Director General.

Section 407

The Gazette

(a) The Gazette referred to in Rule 86 shall be of A4 size and shall be printed by offset, recto-verso.

(b) In addition to the contents specified in Rule 86, the Gazette shall contain, in respect of each published international application, the data indicated in *Annex D*.

(c) The information referred to in Rule 86.1(v) shall be that which is indicated in *Annex E*.

(d) The subscription price of the Gazette shall be as fixed by the Director General*. The price of any single issue of the Gazette shall be as fixed by the Director General*.

Section 408

Priority Application Number

(a) If the application number of the earlier application referred to in Rule 4.10*(c)* (priority application number) is furnished to the International Bureau within the prescribed time limit, that Bureau shall enter the said number in the space provided therefor in the request Form.

(b) If the priority application number is furnished after the expiration of the prescribed time limit, the International Bureau shall indicate, in the international publication, the date on which the said number was furnished, by including on the front page of the pamphlet next to the priority application number the words "FURNISHED LATE ON ... (date)," and their equivalent in the language of the international application, provided that language is French, German, Japanese or Russian.

(c) If the priority application number has not been furnished at the time of the international publication, the International Bureau shall indicate that fact by including on the front page of the pamphlet in the space provided for the priority application number the words "NOT FURNISHED AT TIME OF THIS PUBLICATION," and their equivalent in the language of the international application, provided that language is French, German, Japanese or Russian.

Section 409

Notification of Priority Claim Considered not to have been Made

Where the International Bureau notes that the receiving Office has failed to notify the applicant as provided in Section 302, it shall send a notification to the same effect to the applicant, the receiving Office and the International Searching Authority.

Section 410

Numbering of Sheets of the International Application for Purposes of International Publication

In the course of preparing the international application for international publication, the International Bureau shall sequentially renumber the sheets of the international application only when necessitated by the addition of any new sheet, the deletion of entire sheets or a change in the order of the sheets. Otherwise, the numbering provided under Section 207 shall be maintained.

Section 411

Notification that the Certified Copy of the Priority Document has not been Submitted

Where the time limit under Rule 17.1*(a)* has expired and the International Bureau has not received a certified copy of the priority document, it shall notify the applicant and the designated Offices accordingly.

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* This provision is applicable during the transitional period referred to in Rule 86.4*(b)*.

PART 5

INSTRUCTIONS RELATING TO THE INTERNATIONAL SEARCHING AUTHORITY

Section 501

Corrections Submitted to the International Searching Authority Concerning Expressions, etc., not to be used in the International Application

Where the applicant submits corrections to the International Searching Authority aimed at complying with the prescription of Rule 9.1, that Authority shall transmit copies of such corrections to the receiving Office and the International Bureau.

Section 502

Protest Against Payment of Additional Fee and Decision Thereon

The International Searching Authority shall transmit to the applicant, at the latest, together with the international search report, any decision which it has taken under Rule 40.2*(c)* on the protest of the applicant against the payment of the additional fee. At the same time, it shall transmit to the International Bureau a copy of both the protest and the decision thereon, as well as any request by the applicant to forward the texts of both the protest and the decision thereon to any of the designated Offices.

Section 503

Method of Identifying Documents Cited in the International Search Report

Identification of any document cited in the international search report referred to in Rule 43.5*(b)* shall be made by indicating the following elements in the order in which they are listed:

(a) In the case of any patent document (patent documents being patents within the meaning of Article 2(ii) as well as published applications relating thereto):

(i) the Office that issued the document, by the two-letter code as in *Annex B*;

(ii) the kind of document, by the appropriate symbols as in *Annex C*;

(iii) the number of the document as given to it by the Office that issued it (for Japanese patent documents the indication of the year of the reign of the Emperor must precede the serial number of the patent document);

(iv) the date of publication of the cited patent document as indicated thereon;

(v) where applicable, the pages, columns or lines where the relevant passages appear, or the relevant figures of the drawings; and

(vi) the name of the patentee or applicant.

(The following example illustrates the citation of a patent document according to paragraph *(a)* above:

JA, B, 5014535, published 1975, May 28, see column 4, lines 3 to 27, NCR Corporation.)

(b) In the case of any book or other separately issued publication:

(i) the name of the author;

(ii) the title (including, where applicable, the number of the edition and/or volume);

(iii) the year of publication (when this coincides with the year of the international application or of the priority claim, the International Searching Authority shall endeavor to determine the month and, if necessary, the day of publication and to indicate these data in the international search report);

(iv) the name of the publisher;

(v) as far as available, the place of publication (where only the location of the publisher appears on the book or other separately issued publication, then that location shall be indicated as the place of publication); and

(vi) where applicable, the pages, columns or lines where the relevant passages appear, or the relevant figures of the drawings.

(The following example illustrates the citation of a book or other separately issued publication according to paragraph *(b)* above:

H. Walton, "Microwave Quantum Theory," Volume 2, published 1973, by Sweet and Maxwell (London), see pages 138 to 192, especially pages 146 to 148.)

(c) In the case of any article published in a periodical or other serial publication:

(i) the title of the periodical or other serial publication;

(ii) the number of the volume and the date of the issue in which the article appears;

(iii) as far as available, the place of publication (where only the location of the publisher appears in the periodical or other serial publication, then that location shall be indicated as the place of publication);

(iv) the author and the title of the article and the number of the page both on which the article starts and ends; and

(v) where applicable, the pages, columns or lines where the relevant passages appear, or the relevant figures of the drawings.

(The following example illustrates the citation of an article published in a periodical or other serial publication according to paragraph *(c)* above:

IBM Technical Disclosure Bulletin, Volume 17 No. 5, issued 1974 October (Armonk, New York), J. G. Drop, "Integrated Circuit Personalization at the Module Level" see pages 1344 to 1345.)

(d) In the case of abstracts:

(i) the identification of the document containing the abstract in the manner set forth in paragraphs *(a)*, *(b)* and *(c)*, respectively, depending upon whether the abstract is contained in a patent document, in a book or other separately issued publication, or in an article published in a periodical or other serial publication;

(ii) in the case where the abstract is not published together with the full text document which served as its basis, the identification of both abstract and full text document on the basis of whatever bibliographic data may be available in respect thereto.

(The following example illustrates the citation of an abstract according to paragraph *(d)* (ii) above:

Chemical Abstracts, Volume 75, No. 20, issued 1971, November 15 (Columbus, Ohio, U.S.A.), D. I. Shetulov, "Surface Effects During Metal Fatigue," see page 163, column 1, the abstract No. 120718k, Fiz.-Khim. Mekh. Mater. 1971, 7(2), 7-11 (Russ).)

Section 504

Classification of the Subject Matter of the International Application

(a) Where the subject matter of the international application is such that classification thereof requires more than one classification symbol according to the principles to be followed

in the application of the International Patent Classification to any given patent document, the international search report shall indicate all such symbols.

(b) Where any national classification system is used, the international search report may indicate all the applicable classification symbols also according to that system.

(c) Where the subject matter of the international application is classified both according to the International Patent Classification and to any national classification system, the international search report shall, wherever possible, indicate the corresponding symbols of both classifications opposite each other.

Section 505

Indication of Citations of Particular Relevance in the International Search Report

Where any document cited in the international search report is of particular relevance, the special indication required by Rule 43.5*(c)* shall consist of the letter "X" placed next to the citation of the said document.

Section 506

Comments on Draft Translation of the International Application

(a) Where the applicant has made comments, within the time limits fixed by the International Searching Authority, on the draft translation referred to in Rule 48.3*(b)*, that Authority shall notify the applicant whether it has changed the draft translation and, if so, of the changes it has made therein.

(b) Where the applicant submits comments on the draft translation after the expiration of the time limit fixed by the International Searching Authority, and that Authority changes the draft translation, it shall notify the applicant accordingly.

Section 507

Manner of Indicating Certain Special Categories of Documents Cited in the International Search Report

(a) Where any document cited in the international search report refers to an oral disclosure, use, exhibition, or other means referred to in Rule 33.1*(b)*, the separate indication required by that Rule shall consist of the letter "O" placed next to the citation of the said document.

(b) Where any document cited in the international search report is a published application or patent as defined in Rule 33.1*(c)*, the special mention required by that Rule shall consist of the letter "E" placed next to the citation of the said document.

(c) Where any document cited in the international search report is a document which defines the general state of the art, it shall be indicated by the letter "A" placed next to the citation of the said document.

(d) Where any document cited in the international search report is a document whose publication date occurred earlier than the international filing date of the international application, but later than the priority date claimed in that application, it shall be indicated by the letter "P" next to the citation of the said document.

(e) Where any document cited in the international search report is a document whose publication date occurred after the filing date or the priority date of the international application and is not in conflict with the said application, but is cited for the principle or theory underlying the

invention, which may be useful for a better understanding of the invention, or is cited to show that the reasoning or the facts underlying the invention are incorrect, it shall be indicated by the letter "T" next to the citation of the document.

(f) Where in the international search report any document is cited for reasons other than those referred to in the preceding paragraphs, such document shall be indicated by the letter "L" next to the citation of the document.

Section 508

Manner of Indicating the Claims to which the Documents Cited in the International Search Report are Relevant

The claims to which cited documents are relevant shall be indicated by placing in the appropriate column of the international search report:

(i) where the cited document is relevant to one claim, the number of that claim; for example (2) or (17);

(ii) where the cited document is relevant to two or more claims numbered in consecutive order, the numbers of the first and last claims of the series connected by a hyphen; for example, (1-15) or (2-3);

(iii) where the cited document is relevant to two or more claims that are not numbered in consecutive order, the number of each claim placed in ascending order and separated by a comma or commas; for example (1, 6) or (1, 7, 10);

(iv) where the cited document is relevant to more than one series of claims under (ii) above, or to claims of both categories (ii) and (iii) above, the series or individual claim numbers and series placed in ascending order using commas to separate the several series, or to separate the numbers of individual claims and each series of claims; for example, (1-6, 9-10, 12-15) or (1, 3-4, 6, 9-11).

PART 6

INSTRUCTIONS RELATING TO THE INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

Section 601

Determination Whether Applicant is Entitled to make a Demand

(a) Where the International Preliminary Examining Authority finds that the applicant is not entitled under Article 31(2) or, where there are several applicants, that none of the applicants is entitled under Rule 54.2 to make a demand, the International Preliminary Examining Authority shall notify both the applicant or applicants and the International Bureau accordingly.

(b) Where the International Preliminary Examining Authority finds that, in the case of different applicants for different elected States, none of the applicants indicated for the purposes of a given elected State is entitled under Rule 54.3 to make a demand and that therefore the election of that State shall be considered not to have been made, the International Preliminary Examining Authority shall notify accordingly both the applicant or applicants so indicated and the International Bureau.

Section 602

Marking of Replacement Sheets and Renumbering of Sheets of the International Application

(a) The data to be indicated on any replacement sheet according to Rule 66.8*(b)* shall be indelibly marked by the International Preliminary Examining Authority, so as to admit of direct reproduction in any of the manners set forth in Rule 11.2*(a)*, in the upper right-hand corner of each replacement sheet.

(b) Section 311 applies, *mutatis mutandis*, to the renumbering of sheets of the international application.

Section 603

Transmittal of Protest Against Payment of Additional Fee and Decision Thereon

The International Preliminary Examining Authority shall transmit to the applicant, at the latest together with the international preliminary examination report, any decision which it has taken under Rule 68.3*(c)* on the protest of the applicant against payment of the additional fee. At the same time, it shall transmit to the International Bureau a copy of both the protest and the decision thereon, as well as any request by the applicant to forward the texts of both the protest and the decision thereon to any of the elected Offices.

Section 604

Guidelines for Explanations Contained in the International Preliminary Examination Report

Explanations under 70.8 shall clearly point out to which of the three criteria referred to in Article 35(2), taken separately, any cited document is applicable and shall clearly describe, with reference to the cited documents, the reasons supporting the conclusion that any of the said criteria is or is not satisfied.

[Annexes follow]

(95) PATENT COOPERATION TREATY (PCT) INFORMATION FOR PROSPECTIVE APPLICANTS

This notice includes information on the following topics of interest to prospective PCT applicants:

I. Fees for the processing of International applications
II. PCT Member States which may be designated in International applications
III. PCT International application transmittal letter for use by applicants
IV. Documents concerning the PCT available from the World Intellectual Property Organization (WIPO)

TOPIC I: FEES FOR THE PROCESSING OF INTERNATIONAL APPLICATIONS

(The amounts of the fees have not been changed. The listing appearing in the May 16, 1978 OFFICIAL GAZETTE is reprinted here for the convenience of the public.)

The Patent and Trademark Office when acting as a Receiving Office and International Searching Authority will charge certain fees for the processing of International applications. The name of the fee, the amount and the date when the fee is due are listed below. Applicants are cautioned that the fee amounts are subject to change. Any changes in the amount of the fees, and the effective dates of the changed amounts will be listed in the OFFICIAL GAZETTE.

As failure to pay in full upon filing those fees due upon filing will result in the withdrawal of the International application, applicants are strongly urged to consult the OFFICIAL GAZETTE for specific fee amounts before filing.

PCT PROCESSING FEES (AS OF 01 JUNE 1978)

Fee	*Amount*	*Time Due*
Transmittal Fee	$35.00	Upon filing.
Search Fee	300.00	Upon filing.
Supplemental Search Fee	200.00 per invention	Within time limit set in notice to applicant.
International Fee		
(1) Basic Fee		
First 30 sheets of application	$165.00	Upon filing.
Each sheet over 30	3.00	Upon filing.
(2) Designation Fee		
Each State for which a patent is sought, or, each group of States for which the same Regional patent is sought.	40.00	12 months from priority date or, if no priority date, 12 months from the International application filing date.

TOPIC II: PCT MEMBER STATES WHICH MAY BE DESIGNATED IN INTERNATIONAL APPLICATIONS

Twenty (20) States have ratified or acceded to the Patent Cooperation Treaty. Their names and the date from which these states may be designated in International applications will be printed in the OFFICIAL GAZETTE.

It should be noted that Japan may be designated in international applications filed on and after 01 October 1978, and that Denmark may be designated in international applications filed after 01 December 1978.

The footnotes to the listing of States indicate those States for which regional patent protection is available and any restrictions on the availability of patent protection using PCT.

Applicants are urged to consult also the "PCT Applicant's Guide" and the "Gazette of International Patent Applications" published by the World Intellectual Property Organization (WIPO) as well as the national laws of the Member States for detailed information regarding the availability of protection other than patents in each Member State.

State	*Ratification or Accession*	*Date of Ratification or Accession*	*Date From Which State May Be Designated*
(1) Central African Empire*	Accession	15 September 1971	01 June 1978
(2) Senegal*	Ratification	08 March 1972	01 June 1978
(3) Madagascar	Ratification	27 March 1972	01 June 1978
(4) Malawi	Accession	16 May 1972	01 June 1978
(5) Cameroon*	Accession	15 March 1973	01 June 1978
(6) Chad*	Accession	12 February 1974	01 June 1978
(7) Togo*	Ratification	28 January 1975	01 June 1978
(8) Gabon*	Accession	06 March 1975	01 June 1978
(9) United States of America	Ratification	26 November 1975	01 June 1978
(10) Germany, Federal Republic of**	Ratification	19 July 1976	01 June 1978
(11) Congo*	Accession	08 August 1977	01 June 1978
(12) Switzerland**	Ratification	14 September 1977	01 June 1978
(13) United Kingdom**	Ratification	24 October 1977	01 June 1978
(14) France**	Ratification	25 November 1977	01 June 1978
(15) Soviet Union	Ratification	29 December 1977	01 June 1978
(16) Brazil	Ratification	09 January 1978	01 June 1978
(17) Luxembourg**	Ratification	31 January 1978	01 June 1978
(18) Sweden**	Ratification	17 February 1978	01 June 1978
(19) Japan	Ratification	01 July 1978	01 October 1978
(20) Denmark	Ratification	01 September 1978	01 December 1978

* Members of African Intellectual Property Organization (OAPI) regional patent system. Only regional patent protection is available for OAPI member states. A designation of any state is an indication that all OAPI states have been designated. Note: only one designation fee is due regardless of the number of OAPI member states designated.

** Members of European Patent Convention (EPC) regional patent system. Either national patents or European patents for member States are available through PCT, *except for France*, for which only European patents are available if PCT is used. If regional protection is desired for one or more States, the indication "regional patent" must follow the designation of the State or States. Note: only one designation fee is due if the regional patent protection is sought for several States.

TOPIC III: PCT INTERNATIONAL APPLICATION TRANSMITTAL LETTER

A PCT International application transmittal letter, form PTO–1382, is now available free of charge for applicants to use when filing PCT International applications with the United States Receiving Office. The form, a copy of which is reproduced below, is intended to simplify the filing of PCT International applications by providing a one-page letter which covers the most common requests and concerns of applicants. Specifically covered are:

1) Requests under 37 CFR 1.451 for preparation and transmittal to the International Bureau of certified copies of U.S. national applications, the priority of which is claimed in International applications;
2) Requests for transmittal of the Record Copy by the applicant to the International Bureau under 37 CFR 1.461;
3) Authorizations for any required Supplemental search fees to be charged to a deposit account subject to oral confirmation of the authorization.
4) Statements of preference and authorization for any refund or reimbursement of the Search fee or Supplemental search fee to be credited to a deposit account or to be refunded by U.S. Treasury Department check;
5) Indications of information concerning differences in disclosure, if any, between the international application and related applications to assist in determining any foreign transmittal licensing requirements as well as for other purposes; and
6) Requests for foreign transmittal license.

Copies of the PCT International application transmittal letter, form PTO–1382, may be ordered by mail addressed to the Commissioner of Patents and Trademarks, Box PCT, Washington, D.C., 20231, or by telephone at (703) 557–2003. Copies are also available in Crystal Plaza Building 2, Room 4–C–08, and in the lobby of Crystal Plaza Building 3.

TOPIC IV: DOCUMENTS CONCERNING THE PCT AVAILABLE FROM THE WORLD INTELLECTUAL PROPERTY ORGANIZATION (WIPO)

Prices in U.S. dollars per copy, including mailing charges valid until at least 31 October 1978.

	By surface mail	By airmail
PCT Applicant's Guide	First copy free of charge. For each additional copy: $4.00	$8.00
PCT (Treaty and Regulations)	4.00	5.00
PCT Gazette:		
Subscription for 1978	50.00	60.00
Single issues in 1978	6.00	8.00
Items of Non-Patent Literature under PCT Rule 34.1(b)(iii) (included in the PCT Gazette No. 2) (previously document PCT/INT/1)	6.00	8.00
Administrative Instructions under the Patent Cooperation Treaty (included in the PCT Gazette No. 1)	6.00	8.00
As a separate A4 brochure	3.00	4.00
With its Annexes (all PCT Forms) (previously document PCT/INT/2)	23.00	28.00
Receiving Office Guidelines for the Processing of International Applications under the Patent Cooperation Treaty (document PCT/INT/4)	3.00	4.00
Guidelines for International Search to be Carried Out under the Patent Cooperation Treaty (document PCT/INT/5)	2.00	2.00
Guidelines for International Preliminary Examination to be Carried Out Under the Patent Cooperation Treaty (document PCT/INT/6)	3.00	4.00
Guidelines for Drawings under the Patent Cooperation Treaty (document PCT/INT/7)	First copy free of charge. For each additional copy: 0.50	1.00
Guidelines for the Preparation of Abstracts under the Patent Cooperation Treaty (document PCT/INT/8)	First copy free of charge. For each additional copy: 0.50	1.00
Guidelines for Publication under the Patent Cooperation Treaty (document PCT/INT/9)	4.00	5.00
Time Limits under the Patent Cooperation Treaty (document PCT/INT/10)	6.00	6.00
Records o ithe Washington Diplomatic Conference (1970)	63.00	76.00

Mode of Ordering and Paying

Orders should be addressed to:
WIPO—World Intellectual Property Organization

If by mail:
34, Chemin des Colombettes
1211 Geneva 20
Switzerland

If by telex:
22376 WIPO CH

If by telephone:
99 91 11 (ask for the PCT Division)

Payments may be effected by check or by transfer to the WIPO account at the Swish Credit Bank, 1211 Geneva 11 (Switzerland).

RENE D. TEGTMEYER,
Sept. 12, 1978. *Assistant Commissioner for Patents.*

[975 OG 4]

PCT INTERNATIONAL APPLICATION TRANSMITTAL LETTER

REGARDING THE INTERNATIONAL APPLICATION OF	DATE:
ENTITLED	DOCKET OR REFERENCE NUMBER

To the United States Receiving Office (RO/US):

Accompanying this transmittal letter is the above-identified International application, including a completed request form (PCT/RO/101). Please process the application according to the provisions of the Patent Cooperation Treaty.

The following requests are made of the RO/US:

1. ☐ CERTIFIED COPY PREPARATION—Please prepare a certified copy of the priority document for the above-identified International application and transmit the certified copy to the International Bureau according to the provisions of 37 CFR 1.451.

IDENTIFICATION OF PRIORITY DOCUMENT	U.S. SERIAL NUMBER	U.S. FILING DATE	APPLICANT

To cover the cost of copy preparation and certification,

☐ a (check) (money order) in the amount of $ _____ is attached to this transmittal letter.

☐ the RO/US is hereby authorized to charge the following deposit account no.: _____.

2. ☐ ALTERNATE TRANSMITTAL OF RECORD COPY—As the accompanying International application is being filed within 11 months of the claimed priority date, according to the provisions of 37 CFR 1.461,

☐ hold the Record Copy available for pickup by 10 days before the expiration of 13 months from the claimed priority date in room 2-4C08, Crystal Plaza, Arlington, VA.

☐ mail the Record Copy to me by 15 days before the expiration of 13 months from the priority date.

3. ☐ SUPPLEMENTAL SEARCH FEES—Please charge any Supplemental Search fees that may be required by the United States International Searching Authority (ISA/US) to deposit account no.: _____.

I understand that this authorization is subject to my oral confirmation thereof in each instance and that it in no way limits my right to submit a protest against payment of the Supplemental Search fees, but is merely an administrative aid to ensure that the ISA/US may timely complete the Search Report.

4. ☐ **REFUND OF SEARCH FEES/SUPPLEMENTAL SEARCH FEES**—If the ISA/US determines that a refund or reimbursement of the Search fee and/or any Supplemental Search fees is warranted due to the benefit of a prior search, or due to a decision that applicant's protest is justified, such refund is

☐ to be in the form of a U.S. Treasury check.

☐ authorized to be credited to the following deposit account no.: _____ .

5. ☐ **DISCLOSURE INFORMATION**—In order to assist in screening the accompanying International application for purposes of determining whether a license for foreign transmittal should and could be granted and for other purposes, the following information is supplied:

A. ☐ There is no prior filed application relating to this invention.

B. ☐ There is a prior application, serial number _____ filed on _____ which contains subject matter that is

1. ☐ substantially identical to that of the accompanying International application.

2. ☐ less than that of the accompanying International application. The additional subject matter of the International application appears on page(s) and line(s) _____ .

3. ☐ more than that of the accompanying International application.

C. ☐ Disclosure information cannot be covered by the language of Points 5A or 5B above due to the involvement of several prior applications or for other reasons. A separate sheet on which the disclosure information is explained is attached to this transmittal letter.

6. ☐ **REQUEST FOR FOREIGN TRANSMITTAL LICENSE**—According to the provisions of 35 U.S.C. 184 and 37 CFR 5.11, a license to transmit the accompanying International application to foreign agencies or international authorities is hereby requested.

SIGNER IS THE:	NAME OF SIGNER (typed)
☐ APPLICANT	
☐ COMMON REPRESENTATIVE	SIGNATURE
☐ (ATTORNEY) (AGENT) REG. NO. _____	

PTO-1382 (6/78) U.S. DEPT. of COMM.-Pat. & TM Off.

(96) FILING OF PCT OR EPC FORMAT APPLICATIONS IN CANADA

The following notice, which appeared in the July 4, 1978 issue of the Canadian Patent Office Gazette has been forwarded to the Patent and Trademark Office and is being republished for the information of United States applicants and representatives who may wish to file in Canada. The Canadian notice reads as follows:

"Filing of PCT or EPC Applications in Canada

The Canadian Patent Office will accept all disclosures, claims and drawings prepared in the formats required under the Patent Cooperation Treaty (PCT) or the European Patent Convention (EPC) in respect of Canadian applications for patents.

In particular, the margins called for under the PCT or EPC, while not in conformity with the Canadian Rules, will be accepted for filing and considered sufficient to complete applications. Pages of specifications and drawings may be of a size A4 or 8 x 13 inches so long as the full set of papers in a single application are consistent. The spacing between typed lines may be either double or one and one-half spaces.

J. A. BROWN,
Director, Patents Branch"

July 17, 1978. DONALD W. BANNER,
Commissioner of Patents and Trademarks.

[973 OG 28]

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(97) ANSWERS TO QUESTIONS FREQUENTLY ASKED ABOUT THE PATENT COOPERATION TREATY

The following questions have been frequently asked concerning the Patent Cooperation Treaty (PCT). These questions and brief answers thereto are being published in the hope that they will aid in understanding the PCT. As appropriate, additional questions and answers relating to the PCT will be published from time to time.

1. Who can file an international application in the United States Receiving Office?
Answer: An international application may be filed in the United States Receiving Office (Patent and Trademark Office) by any applicant who is a resident or national of the United States of America (PCT Rule 19.1 and 35 U.S.C. 361(a)). The applicant may be either the inventor or the successor in title of the inventor (owner or assignee) for the purpose of filing an international application. However, the laws of the various designated countries regarding the requirements for applicants must also be considered when filing an international application. When the United States is designated, the applicant for the purposes of the United States of America must be the inventor. At the present time the applicant for all other designated countries may be either the inventor or the owner.

2. How can different applicants for different designated countries be indicated on the Request form?
Answer: An explanation may be given by means of the following example. An international application is to be filed designating the United States, Sweden and Switzerland. The assignee is to be the applicant for Sweden and Switzerland as the invention has been assigned to him. For the purposes of the United States, however, the inventor must be the applicant. If in this example, "A" is the assignee and "B" is the inventor, "A" and "B" must both be indicated as applicants, under Box II of the Request form. The name and other identifying information of one applicant would be placed in Box II and a check mark placed in the small box following the phrase "Additional information is contained in supplemental box." The name and other identifying information of the second applicant would be placed in the Supplemental Box on Page 3 of the Request form and entitled "II. Applicant (continued)." "B" as the inventor would also be named in Box III of the Request. Box IX, on page 2 of the Request, is then used to identify different applicants for different designated countries. In Box IX, "A" would be indicated as the applicant for Sweden and Switzerland, and "B" would be indicated as the applicant for the "United States of America." It should be noted that both "A" and "B" must also sign the Request form or a power of attorney if the Request is signed by an attorney or agent.

3. Must at least one of the inventors, who are the applicants for the United States, be a resident or national of a PCT member country in order to have the United States Patent and Trademark Office accept the application at the national stage?
Answer: The answer is yes, however, this question involves two basic issues which must be addressed separately. One issue relates to the requirements for a valid designation of the United States of America. The other issue relates to the requirements of the U.S. national law in order for the U.S. Patent and Trademark Office to accept the international application for the national stage. As to the first issue, PCT Rules 18.3 and 18.4 require that *at least one* of the applicants for each designated State must be a resident or national of a member country of the PCT Union in order for the designation to be valid. As to the second issue, although the designation of the United States of America may be valid for PCT international procedure, the international application will not be accepted at the United States national stage unless the applicant is the inventor (PCT Article 27(3) and 35 U.S.C. 111 and 373). Therefore, at least one of the inventors must be a resident of a PCT member country in order for the international application to enter the national stage in the United States of America. It should be noted, however, that if the owner or assignee is a resident or national of a PCT member country, the owner can be the sole applicant and file an international application designating all current PCT member countries other than the United States of America. Any invalid designation of States for which at least one applicant is not a resident or national of a Contracting State will be deleted by the Receiving Office.

4. What must be done for an international application to enter the national stage at the United States Patent and Trademark Office?
Answer: An international application will enter the national stage at the United States Patent and Trademark Office generally at the expiration of 20 months from the priority date of the application or if no priority claim is made at 20 months from the actual international filing date. When a declaration of unsearchability under PCT Article 17(2)(a) has been issued by the International Searching Authority, however, the date of entry into the national stage is 2 months from the date of mailing of the declaration of unsearchability (PCT Article 22(2)). By the expiration of the relevant date, the applicable requirements under 35 U.S.C. 371(c) must be received by the United States Patent and Trademark Office to avoid abandonment of the application. Entry into the national stage may also occur earlier at the express request of the applicant under the provisions of 35 U.S.C. 371(f). In order that earlier entry into the national stage may take place the applicable requirements of 35 U.S.C. 371(c) must be received by the United States Patent and Trademark Office. Requirements such as the Search Report and any amendments to the claims if they are not available when the other requirements of 35 U.S.C. 371(c) are met must be submitted promptly after they are made available.

5. Who must sign an international application?
Answer: The Request form of an international application must be signed either by all the applicants (PCT Rule 4.15) or the attorney or agent of all the applicants. In the latter case, a power of attorney signed by all applicants is filed with the international application in the Receiving Office (PCT Rule 2.1).

6. Must a license for foreign filing be obtained in order to file an international application?
Answer: No, a license for foreign filing is not required to file an international application but may be required before the applicant or the U.S. Receiving Office can forward a copy of the international application to a foreign patent office, the International Bureau or other foreign authority (37 CFR 5.11). A foreign filing license to permit transmittal to a foreign office or international authority is not required if the international application does not disclose subject matter in addition to that

disclosed in a prior U.S. national application filed more than six months prior to the filing of the international application (37 CFR 5.11(a)(2)). In all other instances, the applicant should request a license for foreign filing (transmittal) (37 CFR 5.12) and if appropriate, identify any additional subject matter in the international application which was not in the earlier U.S. national application (37 CFR 5.14(c)). This request and disclosure information may be supplied on the PCT international application transmittal letter form, PTO–1382, which was published in the October 3, 1978 issue of the OFFICIAL GAZETTE. If no petition or request for a foreign filing license is included in the international application, and it is clear that a license is required in order to timely transmit the Record Copy, it is current Office practice to construe the filing of such an international application to include a request for a foreign filing (transmittal) license. If the license can be granted it will be issued without further correspondence. If no license can be issued, or further information is required, the applicant will be contacted. The automatic request for a foreign filing license does not apply to the filing of foreign national or regional applications outside the PCT.

7. What effect will a secrecy order have if applied to an international application?
Answer: If a secrecy order is applied to an international application, the application will not be forwarded to the International Bureau as long as the secrecy order remains in effect. If the secrecy order remains in effect at the end of the 14th month after the priority date of the international application, the international application will be declared withdrawn (abandoned) because the Record Copy of the international application was not received in time by the International Bureau (37 CFR 5.3(d), PCT Article 12(3), and PCT Rule 22.3). If the United States of America has been designated, however, it is possible to save the U.S. filing date, by fulfilling the requirements of 35 U.S.C. 371(c) prior to the end of the 14th month.

8. Can designations of additional countries be added after an international application is filed?
Answer: No, it is not possible to add designations to an international application after it is filed. Only those countries for which PCT has come into effect may be designated. The Request form, as filed, must contain the names of all designated countries in which protection is desired (PCT Rule 4.9). However, since the designation fees are not required until one year after the priority date, or the actual international application filing date if no priority is claimed (PCT Article 4(1)(ii) and PCT Rule 15.4(b)), applicants may initially designate all PCT countries in which they may have an interest and later only pay designation fees for those countries in which patent protection is seriously desired. Any designated country for which a designation fee is not timely paid is considered withdrawn (PCT Rule 15.5).

9. Can the PCT be used to obtain patent protection under the European Patent Convention (EPC)?
Answer: Yes, a PCT international application may contain the indication that regional patent protection under the EPC is desired for those States that are members of both PCT and EPC. As of October 1, 1978, six European States are members of both the PCT and EPC; they are: France, Federal Republic of Germany, United Kingdom, Sweden, Switzerland and Luxembourg. In order to indicate that EPC protection is desired for these States, the words "Regional Patent" must be placed after the name of the designated States in Box V on the first page of the Request form, e.g., "United Kingdom, Regional Patent." (PCT Administrative Instructions, Section 203). The Netherlands and Belgium, although members of the EPC, cannot be designated in a PCT international application since they have not ratified the PCT.

10. Can the national office of France be designated under the PCT as the office which would grant patent protection?
Answer: No, French national law states that only EPC regional patent protection is available for France if PCT is used. The Receiving Office will treat the designation of France as the wish to obtain EPC regional patent protection for France, even if the indication "Regional Patent" is missing (PCT Administrative Instructions, Section 203). However, if the European Patent Office is not yet examining the subject matter to which the invention relates, the applicant will be permitted to convert the European application to a French national application.

11. Can United States applicants use Chapter II of the PCT which provides for an international preliminary examination report being issued with an opinion on the (1) novelty, (2) inventive step, and (3) industrial applicability, of each claim in the international application?
Answer: No, an applicant filing in the United States Receiving Office cannot use PCT Chapter II since the United States of America did not ratify Chapter II (PCT Article 31(2)(a)).

12. When will the prior art effect of an international application begin in the United States?
Answer: The prior art effect under 35 U.S.C. 102(e) begins on the date the applicant has fulfilled the requirements of 35 U.S.C. 371(c)(1), (2) and (4). These requirements are that the national filing fee, a copy of the international application and a verified English translation thereof, if it was filed in another language, and an oath or declaration be filed in the Patent and Trademark Office. The international application also becomes prior art upon publication, which occurs either promptly after the expiration of 18 months from the priority date, or earlier at applicant's request.

13. When must a "prior art statement" be filed under the PCT?
Answer: If the United States of America is designated, a prior art statement under 37 CFR 1.97 and 1.98 should be filed at the time of entering the national stage (37 U.S.C. 371(b) or (f) or within three months thereafter. For purposes of 37 CFR 1.97(a) the date of entry into the national stage is considered to be "the time of filing the application."

14. Who may be contacted within the United States Patent and Trademark Office to answer additional questions on PCT?
Answer: Contacts within the United States Patent and Trademark Office include Mr. Louis O. Maassel, Crystal Plaza 3, Room 11D07, (703)557–3070; Ms. Mary E. Turowski, Crystal Plaza 2, Room 9C26, (703)557–3776; and PCT Receiving Office and Information Center, Crystal Plaza 2, Room 4C08, (703)557–2003

DONALD W. BANNER,
Oct. 17, 1978. *Commissioner of Patents and Trademarks*

[976 OG 118]

TRADEMARK NOTICES

(98) INTERVIEWS INVOLVING TRADEMARK APPLICATION

Interviews frequently result in a better understanding of the issues involved, shorten the prosecution and facilitate disposal of applications.

Interviews for discussion of registrability of the mark of a pending application will not be had before the first official Office action thereon and ordinarily not before filing the first response. Arrangements for an interview should be made in advance so that the Examiner may review the case and be familiar with the details involved.

Interviews on Friday will no longer be prohibited as a matter of policy but all interviews should be set at a time satisfactory to all parties concerned.

A memorandum summarizing the conclusions reached at the interview should be prepared by the Examiner and placed in the application file. The memorandum will be retained

in the application file until the prosecution is completed. Such procedure will not, however, relieve the applicant of the responsibility of complying with the requirements of Trademark Rule 2.62.

HORACE B. FAY, JR.,
July 6, 1964. *Assistant Commissioner.*

This supersedes the notice of February 10, 1958, 728 O.G. (TM 1).

[804 O.G. TM 147 (July 28, 1964)]

(99) POWERS OF ATTORNEY IN REGISTERED TRADEMARK FILES

On and after February 1, 1967, communications advising of changes in the powers of attorney for registered trademarks will be placed in the registration files, but will not be acknowledged by the Patent Office. The information will thus be available to those who inspect the files, but since these powers of attorney do not directly concern the Patent Office, acknowledgments are not believed to be necessary.

C. M. WENDT,
Jan. 30, 1967. *Director.*

[835 O.G. TM 95 (Feb. 21, 1967)]

(100) PREFACE TO THE TRADEMARK O.G. NOTICES

In September 1970, a Public Advisory Committee for Trademark Affairs was established by the Secretary of Commerce. The Purpose of this Committee was to advise the Patent Office on ways to increase the efficiency and effectiveness of the administration of the Trademark Act. A report of this Advisory Committee has been received by the Commissioner of Patents. After reviewing the recommendations, although the review is not complete, it has been decided to make certain changes in trademark practice and procedure, and to propose changes in the rules of practice. Beginning with this issue of the OFFICIAL GAZETTE and in subsequent issues as needed, announcements will be published concerning changes in procedures and proposed amendments to the Trademark Rules of Practice.

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WILLIAM E. SCHUYLER, JR.,
June 16, 1971. *Commissioner of Patents.*

Published in 36 F.R. 13232; July 16, 1971

[889 O.G. TM 2 (Aug. 3, 1971)]

(101) REQUEST FOR EXTENSION OF TIME IN WHICH TO OPPOSE

The Patent Office is adopting a new procedure to be used when filing a request for an extension of time in which to oppose under Section 13 of the Trademark Act and Rule 2.102, Trademark Rules of Practice. All requests for extension of time should be submitted in triplicate. The Patent Office will stamp each copy of the request with the action taken and send a copy to the requester and the applicant. The third copy will be entered in the file.

The purpose of this new procedure is to expedite the handling of extensions of time by eliminating the preparation of a formal notice of the disposition of the request. Further, this procedure will provide the applicant with additional information concerning the potential opposition.

WILLIAM E. SCHUYLER, JR.,
June 16, 1971. *Commissioner of Patents.*

Published in 36 F.R. 13232; July 16, 1971

[889 O.G. TM 3 (Aug. 3, 1971)]

(102) INITIAL PROCESSING OF APPLICATION

On February 1, 1972, the operations of the Trademark Application Section of the Patent Office will be reorganized. The purpose of the reorganization is to provide the public and applicants with more current information concerning newly filed applications.

The prompt initial processing of trademark applications is necessary in order to fulfill one of the main Patent Office functions, that of producing a record, accessible to the public, of new trademark activity to facilitate the clearance of new marks for use, determine the registrability of proposed marks, and avoid conflicts with the rights of others. In order to maintain a record of marks applied for which reflects the most current information available to the Office concerning them, the early processing of drawings in order to have them placed in the search room is considered as a first priority. The processing of these drawings includes the assignment of serial numbers, initial classification, duplication of the drawing and the forwarding of copies of the drawing to the search room. Other functions which are necessary in the processing of applications, such as the processing and mailing of filing receipts, are secondary to the processing of drawings.

In past years, there have been delays in processing applications and forwarding application drawings to the search room. These delays have varied from several weeks to several months. In view of the importance, both to applicants and the public, of recording essential information concerning newly filed applications as quickly as possible, a reorganization of the workflow in the Application Section is being effected.

There is no change in the processing of applications through the mail room and finance branch to the Application Section. However, under the new plan, upon receipt in the Trademark Application Section, all applications will be stamped with a serial number, and the drawing of the mark will be reproduced immediately and placed in the search file. This processing will occur as soon as the application files reach the Application Section. Such procedures as determining whether or not an application will receive a filing date, preparation of the file jackets, and mailing of the filing receipt will take place at a later time.

Applicants who wish to be notified promptly of the date their papers were received in the office and their serial number, may send two self-addressed postcards with their application papers. The mail room will stamp both postcards with the date of receipt and return one to the applicant; the second postcard will be stamped with the serial number and forwarded to the applicant from the Application Section. The postcards should contain the applicant's name and the trademark which is the subject of the application. When more than one set of application papers are forwarded under one cover, postcards should be attached to each set of papers for which a receipt is desired.

Under the new system of processing application papers, your particular attention is directed to the following changes as compared to the present procedure.

1. Application drawings will be placed in the public search file prior to the mailing of the filing receipt.

2. By using the postcard system described above, applicants will be notified sooner of the date of receipt of their papers and the serial number of their application. Applicants are encouraged to use the postcard system.

3. Additional papers sent in by the applicant or attorney should be identified by serial number, thereby enabling the office to process these papers quickly.

4. When an application is accompanied by a petition to the Commissioner under § 2.146, the petition will not be considered until processing by the Application Section is complete.

Effective date. The procedure outlined in this notice will become effective February 1, 1972.

RICHARD A. WAHL,
Jan. 11, 1972. *Acting Commissioner of Patents.*

Approved:

JAMES H. WAKELIN, JR.,
Assistant Secretary for Science and Technology.

Published in 37 FR 942; Jan. 21, 1972

[895 O.G. TM 193 (Feb. 22, 1972)]

(103) PETITION TO MAKE TRADEMARK APPLICATIONS SPECIAL

The practice of expediting the prosecution of new trademark applications on request of the applicant (accelerated

prosecution) was rescinded, effective Aug. 1, 1971 (36 F.R. 13231, July 16, 1971; 825 O.G. 2). This action was taken after a careful study of the practice, including a recommendation of the Public Advisory Committee for Trademark Affairs that the Patent Office terminate accelerated prosecution of trademark applications. The study considered both the effect of the procedure on the workload of the Trademark Operations and the broader interest of examining trademark applications in an order which is equitable to all applicants.

Since the termination of this practice, the Office has experienced some increase in the number of petitions requesting the Commissioner to invoke his supervisory authority pursuant to Rule 2.146 in order to advance the examination of applications out of their regular order. This was to be expected since applicants who might have been able to show special circumstances entitling them to advanced examination could previously achieve this special treatment without resorting to a petition. However, some of the petitions now being received are not considered sufficient to justify the extraordinary relief of invoking the supervisory authority of the Commissioner for the purpose of advancing the applications out of their regular order.

In particular, a number of such petitions have been based on the ground that the applicant is about to embark on an advertising campaign or to commit advertising or promotional expenditures in which the mark applied for is material. Such a ground is not considered to constitute appropriate circumstances justifying the advancement of the application out of its regular turn and the petitions based on such ground have been and will continue to be denied. The principal reason for the denial is that these circumstances are applicable to a substantial portion of the trademark applications filed in the Patent Office. The supervisory authority of the Commissioner should be exercised only where an extraordinary reason for such action has been disclosed. See *Anderson & Dyer v. Lowry*, 89 O.G. 1861, 1899 C.D. 230, and *Wilputte v. Van Ackeren*, 103 USPQ 235. Thus, the extraordinary remedy of invoking the supervisory authority of the Commissioner is not considered appropriate under these circumstances.

In the interest of equitable treatment of all applicants, the policy of the Office in granting such petitions will be restricted to those cases in which particular and very special circumstances exist, such as a demonstrable possibility of loss of substantial rights, rather than circumstances which would be equally applicable to a large number of other applicants for trademark registration.

ROBERT GOTTSCHALK,
Commissioner of Patents.

Date: Mar. 13, 1972.

[897 O.G. TM 2 (Apr. 4, 1972)]

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(104) TRADEMARK REGISTRATION TREATY

At the conclusion of the Vienna Diplomatic Conference on industrial property, the Trademark Registration Treaty was signed on June 12, 1973 for the United States. This Treaty is designed to simplify the procedures for obtaining international registration of trademarks for United States companies doing business abroad.

The Treaty was unanimously adopted at the final plenary session. In addition to the United States, the United Kingdom, the Federal Republic of Germany, Italy, Portugal, Hungary, San Marino and Monaco also signed. Some forty-six countries were represented at the Conference. In their closing statements most of the other delegations present indicated their hope to sign before the end of the year. The Treaty remains open for signature through December 31, 1973. The Treaty will enter into force six months after five States have deposited their instruments of ratification or accession.

The negotiations at Vienna represent the climax of the work of several committees of experts and working groups which have met at Geneva since 1970 with the assistance of the World Intellectual Property Organization (WIPO). The U.S. delegation to the Vienna Conference was composed of officials from the Department of State, the U.S. Patent Office and advisors from the private sector. Previous versions of the proposed Treaty were published on February 22, 1972; September 19, 1972; and February 20, 1973; in the OFFICIAL GAZETTE of the U.S. Patent Office. Published in this issue is the complete text of the Trademark Registration Treaty and its Regulations, as adopted by the Conference. For convenience, in addition to the text of the Articles and Regulations as adopted there is included a table of contents at the end of each section.

Additional copies of this material are available upon request to the Commissioner of Patents.

ROBERT GOTTSCHALK,
June 22, 1973 *Commissioner of Patents.*

[912 O.G. TM 205 (July 24, 1973)]

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(105) WORDING IN VERIFICATION OR DECLARATION OF TRADEMARK APPLICATION

Applicants and attorneys are requested to use the following wording in the part of the verification or declaration of the trademark application which indicates the signer's belief that the mark applied for does not resemble another person's mark:

> —that no other person, firm, corporation, or association, to the best of his knowledge and belief, has the right to use such mark in commerce either in the identical form thereof or in such near resemblance thereto *as to be likely, when applied to the goods of such other person, to cause confusion, or cause mistake, or to deceive:*—

The wording emphasized conforms to the present language of both Sections 1(a)(1) and 2(d) of the Trademark Act of 1946.

Some applicants and attorneys, instead of using the wording emphasized above, are still using the now obsolete wording "as might be calculated to deceive" which was promulgated in the forms under the Trademark Act of 1905 and inadvertently continued by the Act of 1946 up to October 1962 in Section 1(a)(1) and in the forms connected with the Act. Section 1(a)(1) of the 1946 Act was amended by Act of October 9, 1962 (Public Law 772, 87th Congress, 76 Stat. 769) to conform it to the language of Section 2(d) of the 1946 Act, since the language of Section 2(d) reflects the thinking at the time the 1946 Act was written. The wording of the trademark forms for the 1946 Act has also been amended appropriately.

It is desirable that proper wording be used. However, since the differences in wording referred to above are considered to be differences of form rather than of substance, Examiners will not require new verifications or declarations. When the obsolete wording is observed and a letter is to be written for other reasons, Examiners will at that time call attention to the fact that the wording is obsolete and should be modified in applications in the future.

RENE D. TEGTMEYER,
Mar. 25, 1974. *Assistant Commissioner for Trademarks.*

[921 O.G. TM 186 (Apr. 23, 1974)]

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(106) REALIGNMENT OF PATENT OFFICE HANDLING OF OPPOSITION PAPERS

In order to increase efficiency in processing papers, all activities connected with the handling of oppositions have been transferred from the Trademark Examining Operation to the Trademark Trial and Appeal Board. As a result of the transfer, requests for extension of time to oppose and matters pertinent thereto are now received and processed by the staff of the Trademark Trial and Appeal Board rather than by the staff of the Office of the Director of the Trademark Examining Operation.

No substantial change in procedure in the handling of papers relative to oppositions and extensions of time is contemplated by this realignment of duties in the Patent Office. Reasonable requests for extensions of time to oppose will continue to be granted with liberality particularly if there is no protest by another party and if the parties are negotiating or otherwise exploring bases for settlement, and fees for both verified and unverified oppositions will continue to be required to be filed within the time prescribed for opposing.

RENE D. TEGTMEYER,
Nov. 14, 1974. *Assistant Commissioner for Trademarks.*

[929 O.G. TM 62 (Dec. 10, 1974)]

(107) CONFERENCE OF PARTIES IN TRADEMARK INTER PARTES PROCEEDINGS

Under the inter partes rules of procedure in trademark cases effective July 1, 1972 (898 O.G. TM 170, May 16, 1972), the interlocutory phases of trademark inter partes proceedings are becoming increasingly involved, and the experience of the Trademark Trial and Appeal Board has been that the difficulties in such proceedings can frequently be resolved more satisfactorily and quickly by conference in person than by correspondence or telephone. Therefore, effective immediately, the following practice is being adopted:

Whenever it appears to the Trademark Trial and Appeal Board that questions or issues arising during the interlocutory phase of a trademark inter partes proceeding have become so complex that their resolution by correspondence or telephone is not practical and would be likely to be facilitated by conference in person of the parties and/or their attorneys with a member or members of the Trademark Trial and Appeal Board, the Board may at its discretion suggest that the parties and/or their attorneys, under circumstances which will not result in undue hardship for any party, meet with the Board at its offices in Crystal Plaza, Arlington, Virginia, to discuss the resolution of difficulties.

C. MARSHALL DANN,
Feb. 3, 1975. *Commissioner of Patents and Trademarks.*

[932 O.G. TM 2 (Mar. 4, 1975)]

(108) INTERNATIONAL PROTECTION OF GOVERNMENT EMBLEMS AND SEALS

Change of Intent

The Patent and Trademark Office, Department of Commerce, intends to forward only the 50 State seals plus one departmental seal for each department listed in the publication "Seals and Other Devices in Use at the Government Printing Office" ("Seals") instead of the entire publication, as indicated on page 59366 of the Federal Register of December 23, 1975.

Since the publication had been printed in 1975, it was assumed that few deletions and additions would be necessary. However, the response to the above notice, along with some necessary deletions, resulted in a large number of seals in the publication requiring deletion. This rendered the publication unacceptable for submission to the World Intellectual Property Organization (WIPO).

Therefore, the Patent and Trademark Office now intends to forward only the 50 State seals along with the departmental seal denoted "No. 1" for each department listed in the "Seals" publication. If this is not the preferred departmental or State seal, the department or State involved is requested to notify the Patent and Trademark Office by September 21, 1976. This notification should either specify the number of the preferred seal, as it appears in the "Seals" publication, or provide a clear, black and white photograph, suitable for reproduction, of the preferred seal. The seal must be no larger than 1½ inches in diameter.

These seals will then be forwarded to WIPO for protection under Article 6*ter* of the Paris Convention for the Protection of Industrial Property.

Address all correspondence to: Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Dated: August 18, 1976.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Published in 41 F.R. 35741

[950 O.G. TM 114 (Sept. 21, 1976)]

(109) PROPOSAL FOR DISTRIBUTION OF TRADEMARK SECTION 8 AND 15 INDEX CARDS TO PRIVATE FIRM

The Patent and Trademark Office received a request from TCR Service, Inc. for index cards which indicate the acceptance of an affidavit under Section 8 and the acknowledgment of an affidavit under Section 15. These cards are currently used by the Patent and Trademark Office to update the Search Room records and then the cards are destroyed.

TCR Service, Inc. has agreed that if the Patent and Trademark Office will provide them with the cards, they will maintain the cards for a six month period after receipt and make them available without charge to any person desiring to use them. After six months, the cards will be destroyed.

Any person having an objection to this proposed procedure should notify the Commissioner of Patents and Trademarks within 60 days from the date of this notice. After that time, the Patent and Trademark Office will announce their decision.

BERNARD A. MEANY,
Mar. 15, 1977. *Assistant Commissioner for Trademarks.*

[957 TMOG 8 (Apr. 12, 1977)]

(110) TRADEMARK RULES OF PRACTICE

The ninth edition of the Trademark Rules of Practice, dated December 1976, is now available. It replaces the previous edition in its entirety.

The Rules are in looseleaf form so as to accommodate revisions. New subscriptions may be ordered from:

Superintendent of Documents
United States Government Printing Office
Washington, D.C. 20402.

The charge is $5.00 for domestic mailing and $6.25 for foreign mailing. Prior subscribers were sent a notice of expiration by the Government Printing Office in January, 1977.

The Rules booklet is available only by subscription. When revisions are issued, they are a part of the subscription and are mailed automatically. Revisions are announced in the OFFICIAL GAZETTE of the Patent and Trademark Office.

BERNARD A. MEANY,
Sept. 16, 1977. *Assistant Commissioner for Trademarks.*

[963 TMOG 12 (Oct. 18, 1977)]

(111) RECORDING OF "TERRITORIAL ASSIGNMENTS" IN THE ASSIGNMENT DIVISION OF THE PATENT AND TRADEMARK OFFICE

It has been the practice of the Assignment Division for many years to refuse to record "territorial assignments," that is, assignments purporting to transfer rights in a trademark registration (not a concurrent use registration) for less than the entire United States. Hereinafter, such documents will be recorded as long as the requirements of the Rules of Practice are met by the documents submitted.

The Office is not addressing the validity or effect of such documents by recording same, but is merely recognizing that such transfers may affect title to a registered mark and therefore ought to be recorded. At the time a Section 8 affidavit or declaration or an application for renewal is filed, the Examiner of Trademarks will consider the effect of such a document.

BERNARD A. MEANY,
Oct. 7, 1977. *Assistant Commissioner for Trademarks.*

[964 TMOG 8 (Nov. 8, 1977)]

(112) TRADEMARK RULE 2.165 REQUIREMENT WHERE A SECTION 8 AFFIDAVIT OF DECLARATION IS HELD INSUFFICIENT

Several recent Petitions to the Commissioner have indicated a failure on the part of registrants and their attorneys to follow the requirements of Trademark Rule 2.165. Therefore, reviewing certain basic elements of this rule is considered timely so as to alert registrants and attorneys to technical errors which might lead to the cancellation of a valuable trademark registration.

Part (*a*) of Rule 2.165 indicates that the examiner will notify the registrant when an affidavit or declaration of use under Section 8 of the Statute is insufficient and the reasons therefor. When the registrant wishes the examiner to reconsider the affidavit or declaration, or when the registrant has taken additional steps to rectify the deficiencies and desires to have the examiner reconsider the affidavit or declaration in light of those steps, the request for reconsideration

must be submitted within 6 months of the date of mailing of the notice of insufficiency.

Note, however, that a supplemental or substitute affidavit or declaration required by Section 8 cannot be considered unless it is received before the expiration of the six year anniversary of the registration. Consequently, registrants should file their affidavits as early as possible during the sixth year following registration.

There are situations where correcting the deficiency in the affidavit or declaration requires recording an assignment with the Assignment Division of this Office. If the recording cannot be completed within 6 months, the registrant must at least repond to the examiner's notice of insufficiency within that period. The response must indicate the steps being taken to correct the deficiency. The examiner can then allow the registrant additional time or suspend action depending on the circumstances. Registrants must always observe the "six month response" period whenever responding to the examiner from an adverse action.

Part (b) of Rule 2.165 permits a registrant to request the Commissioner to review the action of the examiner when he is dissatisfied with that action. Review by the Commissioner should be sought only where it is believed that the examiner has erred in his action. In other words, the Commissioner's role is to review the correctness of the examiner's action and not to serve as an alter ego of the examiner before whom the registrant may seek to correct deficiencies.

When review by the Commissioner has been sought, the decision on that request constitutes the final action of the Patent and Trademark Office. If no review by the Commissioner is sought and if no request for reconsideration of an examiner's action is timely filed, the Commissioner will notify the registrant of the deficiency in the affidavit or declaration after the sixth year has expired. Such notice is never mailed prior to the expiration of the sixth year following registration nor until a reasonable time has elapsed following a six month period from the last action mailed by this Office. This notice constitutes the final action of the Patent and Trademark Office in those cases where the Commissioner's review has not been sought. Once this notice has been mailed, it is too late (under the Rules of Practice) to request the Commissioner to review the action of the examiner. Review would only be proper if an affiant could show circumstances sufficient to suspend the finality element of Rule 2.165(b) pursuant to Rule 2.148.

Registrants will be held to strict compliance with Rule 2.165 as it has been briefed above. Therefore, parties are urged to respond fully as soon as possible after an action is received from the examiner.

BERNARD A. MEANY,
Dec. 12, 1977. *Assistant Commissioner for Trademarks.*

[966 TMOG 80 (Jan. 10, 1978)]

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(113) DISSEMINATION OF TRADEMARK INFORMATION

In order to clarify the policy regarding Trademark Examiners giving out Trademark information to the general public, the following directive has been promulgated:

Trademark Examiners are reminded that they may only be responsive to questions regarding applications pending before them. All other questions regarding Trademark matters must be directed to the Director of the Trademark Examining Operation, 703–557–3268.

Feb. 15, 1978. BERNARD A. MEANY,
Assistant Commissioner for Trademarks.

[968 TMOG 9 (Mar. 14, 1978)]

(114) NOTICE TO PURCHASERS OF TRADEMARK INDICES

An incorrect stock number has been assigned to the "1976 Index of Trademarks."

The correct stock number to be used when ordering the "1976 Index of Trademarks" through the Superintendent of Documents is as follows: 003–004–00532–7. The cost of this publication is $8.00 per copy.

RICHARD J. SHAKMAN,
Mar. 14, 1978. *Assistant Commissioner for Administration.*

[969 TMOG 2 (Apr. 4, 1978)]

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(115) PUBLIC ADVISORY COMMITTEE FOR TRADEMARK AFFAIRS

Notice of Open Meeting

In accordance with Section 10(a)(2) of the Federal Advisory Committee Act (Public Law 92–463), announcement is made of the following Committee meeting.

The Public Advisory Committee for Trademark Affairs will meet from 9:30 A.M. until 5:30 P.M. on June 15, 1978, at the National Lawyers Club, 1815 H Street, NW., Washington, D.C. 20006, in the White Room.

The Committee was established in 1970 to advise the Patent and Trademark Office on steps which can be taken in order to increase the efficiency and effectiveness of the administration of the Trademark Act and to provide a continuing source of knowledge from the private sector to the government in the field.

The agenda for the meeting is as follows:

(1) Introductory Remarks.
(2) Trademark Operation Resources.
(3) Report on the Assignment Branch Operation.
(4) Consideration of an Order of Priority for Trademark Operation Services.
(5) Computerization Report.
(6) Problems Relating to Retrieval of Files from the Warehouse.
(7) Amendment of Trademark Rule 2.120(a)(2).
(8) Review of Comments Made at the USTA Meeting by Government Officials.

The meeting will be open to public observation; approximately 15 seats will be available for the public on a first come—first served basis. If time permits, oral comments by the public of 3 minutes on each topic within the above agenda items will be allowed. To insure proper consideration at the meeting, any comments or suggestions relating to the agenda items should be submitted in writing before June 8. Further comments and suggestions will be accepted after the meeting on any of the matters discussed. Copies of the minutes will be available upon request.

Inquiries may be addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231. Please mark all correspondence to the attention of Committee Control Officer, Patricia M. Davis, Office of Trademark Program Control, Room CP3–11C17. Telephone: 703–557–3881.

LUTRELLE F. PARKER,
Acting Commissioner of Patents & Trademarks.

Apr. 14, 1978.
Approved: Apr. 17, 1978.
FRANCIS W. WOLEK,
Acting Assistant Secretary for Science and Technology.

[970 TMOG 85 (May 16, 1978)]

TRADEMARK REGISTRATION TREATY

Implementing Legislation

On September 3, 1975 the Trademark Registration Treaty (TRT), signed at Vienna, Austria, on June 12, 1973, was transmitted by the President to the Senate of the United States with a view to receiving its advice and consent to ratification. Legislation designed to implement the TRT has been prepared by the Patent and Trademark Office in the Department of Commerce.

Following a suggestion by the General Accounting Office, the Patent and Trademark Office is planning a survey of a random sample of United States trademark owners who would have a direct interest in the TRT and in the changes required in United States trademark law. In order to provide the interested public with the information on which the sampled companies will base their responses, the complete draft legislation, including Summary, Statement of Purpose and Need and Sectional Analysis is reproduced below. A copy of the survey questionnaire will be published in a future issue of the OFFICIAL GAZETTE.

The text of the TRT was reproduced in the OFFICIAL GAZETTE *of July 24, 1973. Some post conference documents, including a history of the Treaty, were reproduced in the* OFFICIAL GAZETTE *of February 11, 1974. The report of the United States delegation to the Vienna Conference was reproduced in the* OFFICIAL GAZETTE *of February 11, 1975. Additional copies of the material reproduced below as well as the previous* OFFICIAL GAZETTE *publications are available upon request to the Commissioner of Patents and Trademarks.*

DONALD W. BANNER,
Commissioner of Patents and Trademarks.
Date: July 11, 1978.

SUMMARY

In 1973, the United States and thirteen other countries signed the Trademark Registration Treaty. This Treaty was transmitted to the Senate on September 3, 1975, with a view to advice and consent to receiving its ratification.

The Trademark Registration Treaty will establish an international trademark filing arrangement, through which persons and companies residing in one of the member States can more easily register trademarks (including service marks, and collective and certification marks) and maintain these property rights in all of the member States. Since the Treaty is not self-executing, the instrument of United States ratification will not be deposited until the necessary implementing legislation is enacted.

The proposed implementing legislation effects the necessary changes in the trademark statutes and provides to persons filing domestic applications the same benefits in the United States as those accorded under the Treaty. The implementing legislation would not come into force until the Treaty enters into force. Entry into force requires the deposit of instruments of ratification or accession by five States.

STATEMENT OF PURPOSE AND NEED

The enclosed bill would amend the Trademark Act of 1946 (60 Stat. 427, as Amended, 15 U.S.C. 1051 et seq.) to implement the Trademark Registration Treaty and make certain of its benefits available to persons filing national applications for United States trademark registration.

First, the bill would implement the Trademark Registration Treaty (TRT), an agreement adopted on June 12, 1973, by the Vienna Diplomatic Conference on Industrial Property to facilitate the protection of trademarks used or intended to be used in international commerce. This Treaty was signed by the United States and was transmitted by the President to the Senate of the United States on September 3, 1975, with a view to receiving its advice and consent to ratification.

Ratification of the Treaty and its implementation by this bill would enable United States nationals and residents to avail themselves of the advantages offered by the Treaty when it has entered into force with respect to the United States. In addition to the procedural implementing provisions, the bill would effect certain changes in the Trademark Act of 1946 (60 Stat. 427, as Amended, 15 U.S.C. 1051 et seq.) that are required to be made in order to comply with certain conditions and requirements of the Trademark Registration Treaty. These changes would not come into effect until the entry into force of the Treaty.

Second, the bill also makes modifications in the present law to provide to United States nationals and residents the same benefits when filing national applications for trademark registration in the United States Patent and Trademark Office as would be available to such applicants in the United States if filing under the Treaty.

Purpose of Trademark Registration Treaty

The Trademark Registration Treaty has as its primary purpose the establishment of a trademark filing arrangement through which persons and companies residing in one of the member States can more easily register trademarks (including service marks, and coilective and certification marks) and maintain these property rights in all of the member States. Separate actions in approximately 150 jurisdictions (i.e. States, possessions, territories, etc.) are now required by United States companies in order to extend the protection of a trademark throughout the world. The complexity and high cost of establishing and protecting trademarks in international markets through the diverse national laws and procedures is a serious problem for businessmen seeking to further their commercial objectives by the sale of trademarked products across national boundaries. However, if trademark protection in potential foreign markets is not secured promptly, the unprotected mark is frequently appropriated by a "pirate" or may even be coincidentally adopted by another.

The entry into force of the Trademark Registration Treaty would help alleviate these problems by establishing an alternative international registration procedure through which the effects of national trademark registration in member countries could be secured, maintained and renewed on a central international register of marks. With a few exceptions, the effects of international registration in each participating State would remain subject to the substantive requirements of the national laws of such State.

History of Treaty Development

The Trademark Registration Treaty is the culmination of continuous efforts, since 1965, by the United States, to participate in an acceptable international arrangement to facilitate the protection of trademarks in international commerce. Consideration was first given to the possibility of United States adherence to the Madrid Agreement for the International Registration of Marks, a special arrangement under the Paris Convention for the Protection of Industrial Property. The Madrid Agreement, in force since 1891, has long operated successfully among twenty-three countries, principally European.

By 1968, it became apparent that there was substantial U.S. private sector opposition to adherence to the Madrid Agreement in its present form, largely because of certain of its features which, it was argued, would be contrary to the interests of United States firms.

From 1968 to 1970, there were efforts to revise the Madrid Agreement to correct these alleged deficiencies, but these efforts were not successful. However, whereas there was opposition to our adherence to the Madrid Agreement, interested private groups continued to urge United States participation in an acceptable trademark registration treaty.

In September, 1970, a United States sponsored resolution to develop a new trademark registration treaty was adopted unanimously by the competent administrative organs of the Paris Convention. After several drafts and examination by three Committees of Experts and several Consultants' groups, a final draft was considered at a diplomatic conference held in Vienna, Austria, from May 17 to June 12, 1973. Fifty States and thirty-one international organizations (governmental and non-governmental) were represented at the conference. On June 12, 1973, the Trademark Registration Treaty was signed by eight countries, including the United States, and remained open for signature until December 31, 1973, by which date a total of fourteen countries had become signatories. The Treaty will enter into force six months after five States have deposited their instruments of ratification or accession. To date, none of the signatory States has ratified the Treaty. Four States (Congo, Gabon, Togo, and Upper Volta) have deposited instruments of accession.

Main Features of Treaty

The Trademark Registration Treaty will establish a multilateral trademark filing arrangement for residents or nationals of its member countries, which provides easier procedures for securing, administering and maintaining national trademark registration effects in other countries by filing a single international application, securing a single international registration and maintaining a record of such rights on a central international register. International registration amounts to central recording of a "bundle of national rights" rather than a separate property right.

With some exceptions (as noted below), the substantive aspects of rights are regulated by each member State according to its national law. The main features of the Treaty are as follows:

1. A national or resident of a member State may file directly with the International Bureau of the World Intellectual Property Organization an international application designating the States in which protection of the trademark is desired. Any number of States, including the applicant's home State, may be designated.

2. The international application may claim the priority (Paris Convention "right of priority") of an earlier first application to register the same trademark.

3. The application is subject to an international fee plus a fee for each designated State (not higher than 100% of the total fees for national registration).

4. After a brief examination as to formal requirements, the trademark is registered by the International Bureau. The details of the international registration are promptly published in English and French in an international gazette and communicated to each of the designated States.

5. Unless refused by a designated State, the international registration is accorded the same legal effect as if the same trademark were registered nationally in that State. The time limit for the initial notice of refusal, including all reasons or possible reasons for refusal, is fifteen months from the date of the international publication. The reasons for refusal cannot be different from those applicable to national applications.

6. If initially refused by any designated State, the owner is notified of the refusal and is guaranteed the same procedural rights of re-examination and/or remedies available in the case of refusals of national trademark applications. Further proceedings are not subject to any Treaty time limits, and are carried out directly between the owner and the concerned national office.

7. The effects of an international registration may be cancelled in any designated State according to the national law of that State. The effect of cancellation is limited to the State in which the legal action for cancellation was brought.

8. An international registration may be renewed at ten year intervals by a single renewal application filed with the International Bureau.

9. States not originally designated may be added later by requesting the recording of later designations of the new States.

10. Assignments, changes of name, limitations of the goods and/or services, etc. may be recorded by filing a single international request, with the same legal effect as if recorded in the national registers.

11. Non-use of the trademark during an initial period of three years counted from the filing date cannot result in refusal or cancellation by any State. However, any State may require that the owner declare his intention to use the trademark in that State and may further provide in its law that no action for infringement may be commenced until the continuing use of the trademark in that State has started and that any remedy (e.g. damages or profits) may relate only to the period after use has commenced.

The benefits of the Treaty will be available only to nationals or residents of member countries. As to such persons, the Treaty may be used to secure protection in a few countries, or in many, depending upon the extent of the commercial interests.

The Treaty provides that the contracting States shall constitute a Union for the international registration of marks. The provisions for administration of the Union are similar to those established for the Patent Cooperation Treaty, which was transmitted to the Senate on September 12, 1972, and was favorably acted on by that body on October 30, 1973.

The Regulations annexed to the Treaty provide rules concerning administrative requirements and procedures and details useful in implementation of the Articles.

Interest of Other Countries

In addition to the United States, the signatories of the TRT include a number of major trading countries (e.g.

Federal Republic of Germany, United Kingdom, Italy, Sweden, Austria). Others are awaiting developments in the United States, which furnished primary impetus to the negotiations. In particular, the interest of most Western European countries is contingent upon United States ratification, primarily because of the existence of the Madrid Agreement. The Trademark Registration Treaty is more modern than the Madrid Agreement, has more advantages for trademark owners and eliminates features which have long inhibited the territorial growth of the Madrid system. However, the position of the Madrid Agreement members is dependent upon the interest of major countries outside that Union in the new arrangement. Of these, the United States is clearly the most important. However, Japan, United Kingdom, Canada, and the Scandinavian group are among other countries outside the Madrid Union which are known to be seriously considering participating in the TRT arrangement, or, failing that, in some other multilateral agreement, such as Madrid.

Main Advantages

The main advantages of the Treaty are the simplified procedures provided in order to secure national registration effects, to maintain the rights thereby acquired, and to continue these rights by renewal. Other benefits are the time limits for national refusal notifications and the limitations on national use requirements.

The Treaty will not be a panacea for all trademark problems. It will establish what is essentially a multilateral trademark filing arrangement, reserving (except for a few points) the substantive aspects of rights to regulation on a country-by-country basis under the national law of each country. However, by limiting participation to States having previously adhered to the Paris Convention for the Protection of Industrial Property, it assimilates or applies the norms and standards of trademark protection law which have been agreed to by the eighty-seven member countries of that Union over the almost 100 years of its existence. The fact that its filing, maintenance and administrative procedures are independent of national procedures means that a framework for future development of international substantive standards and further rationalization of procedures is provided. Also, since trademark piracy is best dealt with preemptively by prompt filing and diligent maintenance practices, the Treaty attacks this problem directly by facilitating the filing and maintenance procedures.

Even the short range objectives and benefits will not be immediately realized upon United States ratification. Five States must ratify before the Treaty enters into force. To date, only eighteen out of the eighty-seven potential member States have taken positive steps (i.e. fourteen signatories and four adherents). The benefits of simplified filing and maintenance will accrue in proportion to the number of member States.

Effect on U.S. System—Cost

As the Treaty matures in terms of the number of participating States, one of its effects will probably be an increase of foreign origin filings in this country (present foreign origin filings are less than 10% of total filings). It is fundamental that the benefits of simplification accrue in both directions. To the extent that any increased filings reflect existing commercial rights, this result would be consistent with a fundamental purpose of the federal trademark registration system, i.e. the central recording of marks in which rights may exist. Because registration is not mandatory in order to secure rights in a trademark in the United States (and this would not change under the Treaty), the U.S. system is designed to encourage federal registration, in order to provide centralized information to those searching for and selecting new marks for new products or services to be sold in commerce. Part of the increase, as explained later, may result from permitting the filing and registration of marks based on an intent to use as an alternative to actual use.

Since the intent to use amendments to be effected by the bill will not come into force until the date of entry into force of the Treaty, none of the financial consequences will accrue until after that date. It is assumed that entry into force will occur promptly after United States ratification, if not before that date. Assuming action by the 95th Congress, increased incremental costs and manpower requirements of the Patent and Trademark Office have been estimated as shown in the following chart.

ESTIMATED COSTS INCURRED BY RATIFICATION OF TRT AND ENACTMENT OF RELATED LEGISLATION [1]

[Dollar Amounts in Thousands]

	FY 1979		Adjustment for FY 1980		Total FY 1980		Adjustment for FY 1981		Total FY 1981	
	M.Y.	Dollar	M.Y.	Dollar	M.Y.	Dollar	M.Y.	Dollar	M.Y.	Dollar
Operational printing [2]		581.9		(+68.7)		650.6		(+54.8)		705.4
Operational, other [3]	21.7	420.3	(+11.6)	(+252.6)	33.3	672.9	(+7.4)	(+176.1)	40.7	849.0
Start-up [4]	3.0	109.8	(−2.0)	(−73.4)	1.0	36.4	(−1.0)	(−31.5)	[5]	4.9
	24.7	1,112.0			34.3	1,359.9			40.7	1,559.3

[1] These estimated costs will be partially offset by fees to the same extent as under our national system.
[2] Assumes additional publication of all applications will be required (see discussion of Sections 9 and 10 of bill in the Sectional Analysis).
[3] Includes supervisory, professional and clerical personnel, and mail.
[4] Includes Legislation and International staff, Organization and Systems, and all travel.
[5] Only travel remains.

An important caveat is that many of the assumptions on which the above estimates are based are, at this point, very speculative. Also, since the Treaty provides for the assessment of country designation fees (paid centrally) at a level equal to the fees for national registration, any increased operational costs of the Patent and Trademark Office due to increased filings will be offset to the same extent as under the national system. The above cost estimate does not reflect these partially offsetting fees.

Additional cost factors, too remote for attempting to estimate at this time, involve contributions to the World Intellectual Property Organization (WIPO) which will serve as the International Bureau under the Treaty. Article 34(5) of the Treaty establishes a working capital fund, constituted by a single payment made by each contracting State. Based on the experience in the case of other treaties administered by WIPO, it is believed that consideration of any working capital fund would be deferred, at least, until several years after the Treaty enters into force. The amount of the initial payment of each contracting State to this fund is computed with due regard to the number of international applications which are filed by residents of that State. Thus, a direct relationship exists between the amount of the payment by the United States and the use of the TRT by U.S. companies.

In starting up for operations under the TRT, the International Bureau will have to establish a budget financed from fees and charges for services rendered by the International Bureau, from sales of publications and other miscellaneous income. While the Madrid Agreement, also administered by WIPO, has operated at a profit for many years, and the TRT is designed to be self-supporting under normal circumstances (Article 34(4)], the possibility of deficits cannot be ruled out altogether. Deficits would be covered out of the working capital fund, which fund would then be reimbursed by the States. Deficits are not expected to be of any significant magnitude. Contributions to the working capital fund would be the responsibility of the Department of State.

Effect on U.S. Trademark Law

Participation in the international system will require that our national trademark law be amended in a number of respects. The most fundamental change is one which would permit the securing of a national registration in the United States based on intention to use the trademark applied for, and provide for an initial period of 3 years during which nonuse of the mark could not be a basis for refusing or cancelling such registration. Consistent with the Treaty, the proposed legislation provides that infringement actions in the courts would continue to be contingent upon the commencement of use, however.

As explained by the President in forwarding the Treaty to the Senate for its advice and consent, there is a sharp difference of opinion among interested persons, firms and associations in the United States as to the desirability of making this change, and, to a lesser extent, other less significant changes, required by the Treaty, in our national law.

The essence of the change in United States law is that it would move us from the strict use approach (today held to only by the United States, and a few other countries, e.g. Republic of Philippines, Panama) to the middle position, i.e. a use or intention to use system similar in principle to that of the British. The change is believed to be more consistent with the legitimate needs of businessmen, especially where international trade is contemplated.

Intention To Use Legislation

In fact, legislation permitting the filing of a trademark application based on an intent to use was widely supported in the private sector and, in the 91st Congress, identical House and Senate bills, substantially the same as the earlier Senate bills, were introduced at the request of the Administration (S. 3110, McClellan; H.R. 14050 Kastenmeier). This legislation was not reintroduced in the 93rd and 94th Congresses, however, since it was known at an early stage in the Treaty negotiations that the use requirements of the United States would be affected.

The support of intention to use legislation in the United States had its foundation in domestic concerns. Under present law actual use of a mark is a prerequisite to the filing of an application for registration. Thus, every applicant for federal registration, in addition to other requirements, must specify in his application the date of first use of the mark and the date of first use in commerce over which Congress has control (usually interstate commerce).

As applied to the adoption of new trademarks, the requirement of establishing use of a mark prior to applying for its registration is unrealistic since the time interval between clearance and adoption of a trademark and use of commercial quantities varies from several months to several years depending upon the products involved. Typically, before a consumer product is marketed commercially, there is considerable time and effort expended in the developmental effects. After having undertaken the effort and expense of creating and planning the promotion of a new mark, however, the businessman may find that the mark is not registrable because of conflict with another mark or some other reason. These problems led to the drafting and introduction of intent to use legislation.

Canada, in 1954, after careful study, adopted a system permitting applications for registration on the basis of an owner's proposed use. The Canadian system is favorably regarded by businessmen, as are the intention to use systems of many other nations. Approximately one-half of the trademark applications filed today in Canada are based on proposed use, rather than actual use, evidencing the usefulness and acceptability of the system.

Differences Between Previous Intention To Use Legislation and the Treaty

Although similar in terms of their substantive effect, the "intent to use" amendments previously proposed in this country do not satisfy the requirements of the Treaty. There are two basic differences:

(1) The time period under the Treaty during which use may not be required cannot be less than 3 years, counted from the filing date.

Under the "intent to use" bills, the time period was flexible, depending upon the length of time consumed by the examination, i.e. 90 days, counted from the date of allowance of the application by the examiner (a shorter period if the application were opposed). Although entirely dependent upon pendency experience of the Patent and Trademark Office, the period of permitted non-use of most of the applied for marks under those bills would have been in the approximate range of one to two years, counted from the filing date.

Whereas the Treaty permits the "reserving" of a mark for an initial 3 years, more extended "reserving" may be precluded under Article 19(3) and this is done in the proposed implementing legislation. Thus, the 3 year period cannot be extended except for extraordinary reasons. The fact that an application is still pending at the date of expiration of the 3 years may *not* be accepted as a reason for extension. The use requirements after 3 years are the same as under present law.

(2) Under the Treaty, the national *registration* effect of an international registration may not, for the initial three year period, be refused or cancelled on the ground of non-use. However, any country may provide that the right to sue for infringement of the registered mark (even during the three years) is subject to the condition of use, i.e. no right to sue until after continuous use has commenced; and that any remedy may relate only to the period after use has commenced.

Under the "intent to use" bills, an application could be filed, and priority secured, based on intent to use, without actual use, but the *registration* would not issue until a declaration demonstrating actual use had been filed and accepted.

The implementing legislation takes into account the above differences, as the Treaty requires. Also, in all respects, the benefits to applicants from the 3 year use moratorium are accorded to United States residents filing regular national applications in the United States as well as to those applicants filing under the Treaty.

A BILL

To amend the Act entitled "An Act to provide for the registration and protection of trademarks used in com-

merce, to carry out the provisions of international conventions, and for other purposes," approved July 5, 1946, as amended.

Be it enacted by the Senate and the House of Representatives of the United States of America in Congress assembled, that, in order to carry out the provisions of the Trademark Registration Treaty and extend its benefits to citizens and residents of the United States pursuant to the authority of Congress to regulate commerce within its control, section 1 of the Act entitled "An Act to provide for the registration and protection of trademarks used in commerce, to carry out the provisions of international conventions, and for other purposes," approved July 5, 1946 (60 Stat. 427), as amended, is amended to read as follows:

"(a) Any person who is the owner of a trademark which is used or intended to be used in commerce may register that trademark on the principal register hereby established, subject to the conditions and requirements of this Act.

"(b) Application by a person described in section 1(a) to register a trademark on the principal register may be made:

(1) By paying in the Patent and Trademark Office the filing fee and filing in such Office—

(A) A written application, in such form as may be prescribed by the Commissioner, signed by the applicant or by a duly appointed representative of the applicant, specifying the applicant's domicile and citizenship and the particular goods in connection with which the trademark is used or intended to be used in commerce;

(B) A drawing of the trademark;

(C) Except where the declaration under section 1(c) is filed together with the application, a declaration of the applicant's intention to use the trademark in commerce in connection with the goods specified in the application;

and by complying with such rules or regulations, not inconsistent with law, as may be prescribed by the Commissioner; or

(2) By designating the United States in an international registration, or in the recording of any later designation in an international registration, published and notified to the Patent and Trademark Office in conformity with the Trademark Registration Treaty: *Provided,* That—

(A) the person applying was entitled to file international applications, is entitled to own international registrations, and is the Owner of the international registration of the trademark sought to be registered under this Act; and

(B) a declaration of such person's intention to use the trademark in commerce in connection with the goods specified in the international registration is notified to the Patent and Trademark Office in conformity with the said Treaty.

"A person whose international application, or request for the recording of later designation, designating the United States, has been declined by the International Bureau may apply to register the same trademark under paragraph (1) of this subsection. If the application under paragraph (1) is filed in the Patent and Trademark Office prior to the expiration of two months, counted from the date of the notification by the International Bureau of its declining of the corresponding international application or request, and if the Commissioner determines that such declining was not justified, the application shall be treated as if it had been filed on the date which would have been the international registration date or the recording date of the later designation had the declining not taken place.

"(c)(1) The applicant of an application for registration under this Act, or the registrant of a registration issued on the basis of such application, shall file in the Patent and Trademark Office, in such form as may be prescribed by the Commissioner, a declaration stating that the trademark is in use in commerce and that such use commenced on or prior to the date of expiration of three years counted from the filing date of the application, and specifying the date of his first use of the trademark, the date of his first use of the trademark in commerce, those of the particular goods identified in the registration, or, if the registration has not been issued, in the application for registration, in connection with which the trademark is used, and the mode or manner in which the trademark is used in connection with such goods. The declaration shall be signed by the registrant or his duly appointed representative, or, if the registration has not been issued, by the applicant or his duly appointed representative, and it shall be accompanied by such number of specimens or facsimiles of the trademark as actually used as may be prescribed by the Commissioner. Where the declaration concerns an application filed under, or registration issued pursuant to, section 1(b)(2), it may, in such form as may be prescribed by the Commissioner or in the form prescribed by the Trademark Registration Treaty, be filed with the International Bureau, with the same effect as if it had been filed in the Patent and Trademark Office on the date on which it was received by the International Bureau.

(2) The declaration under paragraph (1) of this subsection may be filed together with the application to which it pertains, or later: *Provided,* That unless such declaration has been filed prior to the expiration of four years, counted from the filing date, the Commissioner shall cancel the registration, if issued, or refuse the application for registration, if pending. If the declaration is accepted in respect of fewer than all of the goods stated in the registration or identified in the application, the application or registration shall be limited by the Commissioner to those of the particular goods specified in the declaration in connection with which the mark is in use in commerce.

(3) If an application for registration is pending after the expiration of the three-year period referred to in paragraph (1) of this subsection, or if a registration is relied upon in an opposition or cancellation proceeding under this Act which was filed, or which is pending, after the expiration of such period, the Commissioner may require that the declaration under this subsection in respect of such application or registration be filed within such earlier period as he may prescribe: *Provided,* That such earlier period shall not expire earlier than 2 months, counted from the date of a notice mailed to the applicant or registrant.

(4) If a person who applied for registration of a trademark under this Act, or any successor, assignee or related company of such applicant, shall subsequently apply for registration under this Act of the same or a substantially equivalent trademark on or prior to the date of expiration of five years from the filing date of the said earlier application in respect of all or fewer than all of the goods recited in the said earlier application, the three-year period referred to in paragraph (1) of this subsection shall, in respect of those of the goods which are the same, be counted from the filing date of the said earlier application, or if there were more than one such earlier application, from the filing date of the earliest of them: *Provided,* That this paragraph shall not be applicable if a declaration of use

conforming to the requirements of this subsection is filed together with the said subsequently filed application.

(5) Upon a satisfactory showing by the applicant or registrant that his failure to commence use of the mark in commerce on or prior to the date of expiration of the three-year period referred to in paragraph (1) of this subsection was due to extraordinary circumstances which excuse such failure and was not due to any intention to abandon the mark, the Commissioner may extend the date of expiration of the said period and of the time limit for filing the declaration under this subsection: *Provided,* That the said expiration dates may not be extended for the reason that the application for registration was pending after the date of expiration of the said three-year period.

(6) The Commissioner shall notify the applicant or registrant who files the above prescribed declaration of his acceptance or refusal thereof and, if a refusal, the reasons therefor.

"(d) In any application in respect of which the declaration under section 1(c) has been filed, the applicant may claim concurrent use. If concurrent use is claimed, the applicant shall state exceptions to his claim of exclusive use, in which he shall specify, to the extent of his knowledge, any concurrent use by others, the goods in connection with which and the areas in which each concurrent use exists, the periods of each use, and the goods and area for which the applicant desires registration.

"(e) If the applicant is not domiciled in the United States he shall designate by a written document filed in the Patent and Trademark Office the name and address of some person resident in the United States on whom may be served notices or process in proceedings affecting the trademark. Such notices or process may be served upon the person so designated by leaving with him or mailing to him a copy thereof at the address specified in the last designation so filed. Unless filed with the application, the document designating such person shall be filed on or prior to the date on which the applicant, or the registrant of any registration issued on the basis of such application, replies to any communication by the examiner, or otherwise institutes or defends any proceeding under this Act, relating to such application or registration. Until such person has been designated, or if the person so designated cannot be found at the address given in the last designation, such notices or process may be served upon the Commissioner."

SEC. 2 The first sentence of section 3 of such Act is amended by striking out "used in commerce".

SEC. 3 The first sentence of section 4 of such Act is amended by striking out "used in commerce" and by inserting, following "exercising", the words "or intending to exercise".

SEC. 4 Section 5 of such Act is amended by inserting, following "used" (first occurrence), the words ", or is intended to be used,"; and by inserting, following "use" (both occurrences), the words "or intention to use".

SEC. 5(a) The second sentence of section 7(a) of such Act is amended by inserting, following "date" (third occurrence), the words "of issue"; by striking out "date on which the application for registration was received in the Patent and Trademark Office" and inserting in lieu thereof the words "filing date"; and by changing the period at the end of the sentence to a colon and adding the following proviso:

"*Provided,* That if the declaration under section 1(c) has not been filed, this fact shall be indicated in lieu of the dates of first use of the mark."

(b) A new sentence is added to section 7(a) of such Act reading as follows:

"The Commissioner shall cause a notice concerning the issuance of the registration to be published in the Official Gazette of the Patent and Trademark Office."

(c) Section 7(b) of such Act is amended to read as follows:

"Subject to any conditions and limitations stated therein, a certificate of registration of a mark upon the principal register provided by this Act shall be prima facie evidence of the validity of the registration, of the registrant's ownership of the mark, and of the right of the registrant to prevent registration under this Act by any other person, except a lawful concurrent user, of the mark either in the identical form as reproduced in the registration, or in such near resemblance thereto as to be likely, when applied to the goods or services of such other person, to cause confusion or to cause mistake, or to deceive."

(d) Section 7(d) of such Act is amended by inserting, preceding the first sentence of such subsection, "(1)" and by adding, at the end thereof, the following new paragraphs:

"(2) The registrant of any registration under this Act may limit the goods and/or services specified in his registration by filing an application, in such form as may be prescribed by the Commissioner, for the recording of such limitation or, in the case of a registration issued on the basis of an application under section 1(b)(2), or renewed pursuant to section 9(b)(2), by filing at the International Bureau a request for the recording of a limitation, in respect of the United States, of the goods and/or services of the international registration on the basis of which such registration was issued. The Commissioner shall refuse to record any limitation requested by the registrant if its effect would be to enlarge the scope of the goods and/or services beyond that of the goods and/or services specified in the registration. The recording by the International Bureau of a limitation of the goods and/or services, in respect of the United States, of an international registration shall, unless refused by the Commissioner, have the same effect as if such limitation had been entered in the records of the Patent and Trademark Office on the same date of such recording."

"(3) Where the Commissioner has limited the goods and/or services of any registration pursuant to the provisions of paragraph (2) of this subsection, or sections 1(c)(2), 8(a)(2), or 9(c)(2) of this Act, appropriate entry of such limitation shall be made in the records of the Patent and Trademark Office and, if requested by the registrant, upon the certificate of registration or, if such copy is lost or destroyed, upon a certified copy thereof."

(e) Section 7 of such Act is amended by adding, after subsection 7(g), the following new subsection:

"(h)(1) Appropriate entry shall be made in the records of the Patent and Trademark Office of any recording notified to it by the International Bureau in respect of a registration issued on the basis of an application under section 1(b)(2), or renewed pursuant to section 9(b)(2), unless the effect of such recording has been refused in conformity with the provisions of this Act or of the Trademark Registration Treaty.

(2) The Commissioner shall notify the International Bureau as provided in the Trademark Registration Treaty before making any entry, other than as specified in paragraph (1) of this subsection, in the records of the Patent and Trademark Office in respect of a registration issued on the basis of an application

under section 1(b)(2), or renewed pursuant to section 9(b)(2), and the entry in such records shall not be made until the corresponding entry has been annotated and published by the International Bureau as provided in the said Treaty."

SEC. 6 Section 8(a) of such Act is amended to read as follows:

"(1) The initial term of a registration under this Act shall be 10 years counted from the filing date:

Provided, That the registration of any mark under the provisions of this Act shall be cancelled by the Commissioner at the end of 6 years counted from its date of issue, unless, within 1 year next preceding the expiration of such 6 year period, the registrant shall file in the Patent and Trademark Office, in such form as may be prescribed by the Commissioner, an affidavit or declaration showing that the mark is still in use in commerce. Special notice of the requirement for such affidavit or declaration shall be attached to each certificate of registration. Where the affidavit or declaration concerns a registration issued pursuant to section 1(b)(2), it may, in the form prescribed herein, or in the form prescribed by the Trademark Registration Treaty, be filed with the International Bureau, with the same effect as if it had been filed in the Patent and Trademark Office on the same date as the date on which it was received by the International Bureau.

(2) If the affidavit or declaration of use under paragraph (1) of this subsection is accepted in respect of fewer than all of the goods and/or services stated in the registration, the registration shall be limited by the Commissioner to those of the particular goods and/or services specified in the affidavit or declaration in connection with which the mark is still in use in commerce.

(3) Upon a satisfactory showing by the registrant that his nonuse of the mark in commerce is due to special circumstances which excuse such nonuse and is not due to any intention to abandon the mark, the Commissioner may extend the time for filing the affidavit or declaration under this section."

SEC. 7 Section 9 of such Act is amended to read as follows:

"(a) The owner of a mark which is still in use in commerce may renew his registration of that mark for periods of ten years from the end of each expiring period of the registration, subject to the conditions and requirements of this Act.

"(b) Renewal of a registration by a person described in section 9(a) may be effected:

(1) By paying in the Patent and Trademark Office the prescribed fee and filing in such Office—

(A) within the six months next preceding the date of expiration of the period for which the registration was issued or renewed, an application for renewal; or

(B) prior to the expiration of six months counted from the date of expiration of the period for which the registration was issued or renewed, an application for late renewal, on payment of the additional fee herein prescribed;

and by complying with such rules or regulations, not inconsistent with law, as may be prescribed by the Commissioner; or

(2) By the renewal of an international registration in respect of which the United States is a designated State, published and notified to the Patent and Trademark Office in conformity with the Trademark Registration Treaty, *Provided:* That the person applying is entitled to own international registrations and is the Owner of the international registration of the mark sought to be renewed under this Act.

If the Commissioner refuses an application for renewal of a registration filed under paragraph (1), he shall notify the registrant of his refusal and the reasons therefor. The provisions of section 1(e) shall be applicable to any person not domiciled in the United States who applies for or effects the renewal of a registration under this Act.

"(c)(1) The registrant of a registration renewed under this Act shall file in the Patent and Trademark Office, in such form as may be prescribed by the Commissioner, a declaration stating that the mark is still in use in commerce, and specifying those of the particular goods and/or services identified in the registration on or in connection with which the mark is so used. The declaration shall be signed by the registrant or by his duly appointed representative, and shall be accompanied by a specimen or facsimile showing current use of the mark. Where the renewal is effected pursuant to section 9(b)(2), the declaration may, in the form prescribed herein, or in the form prescribed by the Trademark Registration Treaty, be filed with the International Bureau, with the same effect as if it had been filed in the Patent and Trademark Office on the date on which it was received by the International Bureau.

(2) The declaration under paragraph (1) of this subsection may be filed together with the application for renewal under section 9(b)(1), or, in the case of a renewal effected pursuant to section 9(b)(2), with the demand for renewal of the corresponding international registration filed with the International Bureau, or later: *Provided,* That unless such declaration has been filed prior to the expiration of six months, counted from the starting date of the term of renewal, the Commissioner shall cancel the registration. If the declaration is accepted in respect of fewer than all of the goods and/or services stated in the registration, the registration shall be limited by the Commissioner to those of the particular goods specified in the declaration in connection with which the mark is still in use in commerce.

(3) Upon a satisfactory showing by the registrant that his nonuse of the mark in commerce is due to special circumstances which excuse such nonuse and is not due to any intention to abandon the mark, the Commissioner may extend the time for filing the declaration under this section.

(4) The Commissioner shall notify the registrant who files the above prescribed declaration of his acceptance or refusal thereof and, if a refusal, the reasons therefor."

SEC. 8(a) Section 10 of such Act is amended by inserting, preceding the first sentence of such section, "(a)(1)", by striking out "(d)" in the last sentence and inserting in lieu thereof "(e)", and by adding at the end of such section the following new paragraphs:

"(2) A change in the ownership of a registration or application for registration under this Act may be recorded in the Patent and Trademark Office in such form as may be prescribed by the Commissioner, or, in the case of an application filed or registration issued pursuant to section 1(b)(2), or renewed pursuant to section 9(b)(2), by recording the change in Ownership, in respect of the United States, of the international registration on the basis of which such application was filed or such registration was issued. The recording by the International Bureau of a change in the Ownership, in respect of the United States, of an international registration shall, if valid,

have the same effect as if such change had been entered in the records of the Patent and Trademark Office on the same date as the date of such international recording.

"(3) The recording of a change in ownership pursuant to paragraph (2) which is the result of an assignment of the registered or applied for mark shall, as of the date of such recording, be accorded the same effects as those which are accorded to the recording of such assignment: *Provided,* That within three months from the date of notice of such recording, mailed to the person who applied therefor, or, where the recording is effected by the International Bureau, from the date of publication of such international recording, instruments of assignment conforming to the requirements of paragraph (1) have been recorded in the Patent and Trademark Office.

"(4) Any person, not entitled to file international applications, who has, nevertheless, become the owner of an application filed or registration issued pursuant to section 1(b)(2), or renewed pursuant to section 9(b)(2), other than as a result of a contract between him and the previous applicant or registrant, may file an application for registration of the same mark under section 1(b)(1). If the application under section 1(b)(1) is filed by such person in the Patent and Trademark Office within two years from the said change in ownership and prior to six months after the expiration of the initial term, or of the then running term of renewal, of the international registration on which such application or registration is based, it shall, in respect of those of the goods and/or services which are the same, be treated as if it had been filed on the same date as the date on which the designation of the United States in such corresponding international registration took effect: *Provided,* That such application under section 1(b)(1) conforms to all of the requirements of this Act."

(b) Section 10 of such Act is amended by adding the following subsections:

"(b) Instruments evidencing changes in the name of the applicant or registrant may be recorded in the Patent and Trademark Office, in such form as may be prescribed by the Commissioner, or, in the case of a registration issued on the basis of an application filed under section 1(b)(2), or renewed pursuant to section 9(b)(2), by recording the change in the name of the Owner of the international registration on the basis of which such registration was issued. The recording by the International Bureau of a change in the name of the Owner of an international registration, in which the United States is a designated State, shall, if valid, have the same effect as if it had been entered in the records of the Patent and Trademark Office on the same date as the date of such recording.

"(c) Where at any time, as a result of a final decision in any proceeding under this Act, it is determined that a recording made under this section is void or that such recording was made contrary to the requirements of the Act, the Commissioner shall, upon request of any interested party, cause an appropriate correction to be entered in the records of the Patent and Trademark Office. If such recording was effected on the basis of a recording in respect of an international registration, the Commissioner shall, if appropriate, deny the effect of such international recording and notify the International Bureau accordingly, as prescribed in the Trademark Registration Treaty."

SEC. 9 Section 12(a) of such Act is amended to read as follows:

"Upon the filing of an application for registration, the Commissioner shall refer the application to the examiner in charge of the registration of marks, who shall cause an examination to be made. Unless the application has been previously withdrawn or abandoned, the mark shall be published in the OFFICIAL GAZETTE of the Patent and Trademark Office at such time as the Commissioner shall prescribe, not later than 12 months, counted from the filing date of the application. In the case of an applicant claiming concurrent use, or in the case of an application to be placed in an interference as provided for in section 16 of this Act, the mark may be published subject to the determination of the rights of the parties to such proceedings."

SEC. 10 Section 12(b) of such Act is amended by striking out "6" in two places and inserting, in lieu thereof "3" and by adding at the end thereof:

"Except for the failure of an applicant to comply with the requirements of section 1(c), no mark shall be refused registration for a reason which has not been indicated in a communication given or mailed to the applicant on or prior to 12 months, counted from the filing date: *Provided,* That this limitation shall not apply to any refusal determined by the Trademark Trial and Appeal Board or by a court."

SEC. 11 The second sentence of section 13 of such Act is amended by changing the period at the end of this sentence to a colon and adding a proviso and a new third sentence reading as follows:

"Provided, That such time shall in no event be extended to a date which is later than 14 months, counted from the filing date of the application for registration in respect of which the extension of time for filing opposition is requested. An opposition may be filed by a duly authorized attorney of the opposer."

SEC. 12 Section 14 of such Act is amended by inserting, following "person" the words, "or by a duly authorized attorney of any person"; by inserting, following "date" in clause (a), the words "of issue", and by inserting, following "thereunder", in clause (c), the following words:

"or, in the case of a registration issued on the basis of an application under section 1(b)(2), or renewed pursuant to section 9(b)(2), on the ground that the registrant was not entitled to own international registrations,".

SEC. 13 The first sentence of section 15 of such Act is amended by inserting, following the third occurrence of "date", the words "of issue".

SEC. 14 The first sentence of section 16 of such Act is amended by inserting, following "may" the words ", prior to the publication under section 12(a) of such mark,".

SEC. 15 Section 17 of such Act is amended by inserting, between the first and second sentences thereof:

"Where an interference, opposition to registration or concurrent user proceeding concerns an application for registration under this Act of a mark, the entitlement to registration of which has not been finally determined by the examiner in charge of the registration of marks or, as a result of an appeal from a final refusal of the examiner, by the Trademark Trial and Appeal Board or a court, the Commissioner may, with notice to all parties, defer the commencement of such proceeding until such final determination has been made."

SEC. 16 The first sentence of paragraph (1) of section 21(a) of such Act is amended by inserting, following "affidavit", the words "or declaration"; and by striking out "section 8" and inserting in lieu thereof "section 8, 1(c), or 9(c)".

SEC. 17 Section 22 of such Act is amended by inserting, at the beginning of the sentence, "Issuance of a" and by changing the "R" in "Registration" to "r".

SEC. 18 Section 23 of such Act is amended by inserting, following "commerce" in the second sentence of such section, ", or are intended to be used in commerce,"; by striking out in the second sentence of such section "for the year preceding the filing of the application"; by inserting between the second and third sentences of such section: "An application for the registration of a mark shall be treated as an application under this section only if the application or, in the case of an application pursuant to section 1(b)(2), if the international registration or recording of later designation which is the basis for such application, contains an indication to this effect."; and by striking out in its entirety the last sentence of such section.

SEC. 19(a) The second sentence of section 24 of such Act is amended by inserting, preceding "may," the words ", or his duly authorized attorney," and by striking out the word "verified".

(b) The fourth sentence of section 24 of such Act is amended by inserting, following "used", the words ", following the date of expiration of the period referred to in section 1(c)(1),".

SEC. 20 The second sentence of section 30 of such Act is amended to read as follows:

"When the goods and/or services specified in an application fall within a plurality of classes, a fee equalling the sum of the fees for filing an application in each class shall be paid, and the Commissioner may issue a single certificate of registration for such mark."

SEC. 21(a) Subsection (a) of section 31 of such Act is amended by striking out paragraph (3) of such subsection, by appropriately renumbering the remaining paragraphs; and by inserting, following "mark" in newly renumbered clause (6) (old paragraph (7)), ", change in the name of the registrant,".

(b) Section 31 of such Act is amended by adding, after subsection 31(c), the following new subsection:

"(d) The fees specified in paragraphs (1) and (2) of subsection (a) shall, in the case of applications pursuant to section 1(b)(2) and renewals pursuant to section 9(b)(2), be deemed to be substituted for, respectively, by the individual State fees and the individual State renewal fees applicable to designations of and renewals concerning the United States pursuant to the Trademark Registration Treaty. The Commissioner shall communicate to the International Bureau the amounts of such individual State fee and individual State renewal fee and such amounts shall be the same, respectively, as the amounts of the fees specified in paragraphs (1) and (2) of subsection (a)."

SEC. 22 Section 32(1) of such Act is amended by adding at the end of such section the following sentence:

"No action under this section may be started by the registrant of a registration issued under this Act until the declaration under section 1(c) in respect of the mark which is the subject of such registration has been filed in the Patent and Trademark Office and accepted by the Commissioner."

SEC. 23(a) Section 33(a) of such Act is amended by inserting following "registration" (second occurrence), the words ", and in respect of which the mark is stated to be in use in commerce in the registration, or in the declaration under section 1(c) which has been filed in the Patent and Trademark Office and accepted by the Commissioner,"

(b) Paragraph (5) of section 33(b) of such Act is amended by inserting, preceding "registration" the words "the date of issue of the".

(c) Section 33 of such Act is amended by adding, after subsection 33(b), a new subsection reading as follows:

"(c) For the purpose of determining priority of rights in any proceeding under this Act, an application for registration of a mark which has not been withdrawn or abandoned or a registration issued on the basis of such application, shall, from and after its filing date, be accorded the same effect as if the applicant, or the registrant, had commenced use of the mark in commerce on the said filing date, without derogation, however, of any earlier priority based on use of the mark commenced earlier than the said filing date or of any right of priority to which the applicant or registrant may be entitled pursuant to section 44(d) of this Act."

SEC. 24 Section 35 of such Act is amended by adding at the end of such section the following sentence:

"Any remedy under this section shall relate only to the period after the registrant commenced the continuing use of the mark in commerce."

SEC. 25 Section 44(a) of such Act is amended by inserting, preceding the first sentence of such subsection, "(1)" and by adding, at the end thereof, the following new paragraphs:

"(2) The Commissioner shall keep a register of international registrations designating the United States which have been published and notified to the Patent and Trademark Office in conformity with the Trademark Registration Treaty, including renewals thereof and recordings related thereto, and shall be authorized to accord and refuse effects, communicate notifications, make attestations, decide petitions, determine the amounts of and receive payments of fees, and perform all other acts prescribed by the said Treaty, subject to the requirements thereof.

"(3) Where the time limit for a notification to the International Bureau prescribed by the Trademark Registration Treaty is stated in terms of the date of receipt of such notification by the International Bureau, such notification shall be transmitted by Registered Mail no later than 14 days prior to the expiration of the time limit and, except where an agency of the said Bureau, established pursuant to the said Treaty, is operating within the United States, shall be transmitted to that bureau via Air Mail.

"(4) A mark subject of an application under section 1(b)(2) in respect of which no notification of refusal or possible refusal was received by the International Bureau within the time limit fixed in Article 12(2)(a)(i) of the Trademark Registration Treaty shall be automatically entitled to registration under this Act on the same register as the one for which such application was made. Upon request by the applicant of such an application and unless the registration has been previously issued, the Commissioner shall issue the registration to which such applicant is entitled under this paragraph and the date of issue of such registration shall be the date of the OFFICIAL GAZETTE next preceding the date of expiration of the said time limit. Registration of a mark under the provisions of this paragraph shall be without prejudice to the right of any person to petition to cancel such registration under section 14 of this Act for any reason, including one which was referred to in a refusal made pursuant to section 12(b) or in an opposition filed pursuant to section 13, the notification of which was not received by the International Bureau or which was not received by such Bureau within the said time limit. If a registration is

issued pursuant to this paragraph in respect of a mark, the registration of which had been opposed in a timely filed opposition, the Commissioner shall notify the opposer in such opposition and shall, upon request of such opposer received within 30 days from the date of such notice, direct the Trademark Trial and Appeal Board to determine and decide the rights of registration as if the opposition to registration had been filed as an application to cancel the said registration on the date of issue of such registration.

"(5) Failure by the applicant of an international application or by the Owner of an international registration to act within prescribed time limits in connection with requirements pertaining to an international application, international registration or later designation designating the United States, or to any recording related thereto, may be excused upon a showing satisfactory to the Commissioner of unavoidable delay, to the extent not precluded by the Trademark Registration Treaty or by this Act."

SEC. 26 Section 44(c) of such Act is amended by striking out the first sentence of such section; and by striking out the heading, preceding the second sentence, "Country of origin defined."

SEC. 27 Section 44(d) of such Act is amended to read as follows:

"An application for registration of a mark under sections 1, 2, 3, 4 or 23 of this Act filed by a person described in paragraph (b) of this section who has previously duly filed an application for registration of the same mark in one of the countries described in paragraph (b), or a regular international application in respect of the same mark designating at least one country other than the United States, shall be accorded the same force and effect as would be accorded to the same application if filed under this Act on the same date on which such application was first filed in such foreign country, or on which such international application was first filed with the International Bureau: *Provided*, That—

(1) The application under this Act is filed within 6 months from the date on which the application was first filed in the foreign country or on which the international application was first filed with the International Bureau;

(2) The rights acquired by third parties before the date of the filing of the first application in the foreign country or of the first international application shall in no way be affected by a registration obtained on an application filed under this subsection (d);

(3) Nothing in this subsection (d) shall entitle the owner of a registration granted under this section to sue for acts committed prior to the date on which such registrant has commenced the continuing use of the mark in commerce.

In like manner and subject to the same conditions and requirements, the right provided in this section may be based upon a subsequent regularly filed foreign application or subsequent regular international application, instead of the first filed foreign application or international application: *Provided*, That any foreign application or international application filed prior to such subsequent application or international application has been withdrawn, abandoned, or otherwise disposed of, without having been laid open to public inspection and without leaving any rights outstanding, and has not served, nor thereafter shall serve, as a basis for claiming a right of priority."

SEC. 28(a) The paragraphs headed "Trademark," "Service Mark," "Certification Mark," "Collective Mark" and "Intent of Act" in section 45 of such Act are amended by inserting, following each occurrence of "used", the words "or intended to be used".

(b) Clause (a) of the paragraph in section 45 of such Act headed "Abandonment of Mark" is amended to read as follows:

"(a) when its use has not commenced and there is no intent to commence use or when its use has been discontinued with intent not to resume. Lack of intent to commence or intent not to resume may be inferred from the circumstances. If use of a mark has been discontinued, its nonuse for two consecutive years shall be prima facie abandonment."

(c) Section 45 of such Act is amended by adding the following paragraphs:

"Filing date. The filing date of an application for registration under section 1(b)(1) shall be the date on which all of the elements prescribed by the Commissioner as minimum elements for according a filing date have been received in the Patent and Trademark Office. The filing date of an application for registration under section 1(b)(2) shall be the same date as the international registration date of the international registration or, if applicable, the recording date of the later designation, on the basis of which such application is filed."

"Date of issue. The date of issue of a registration under this Act is the date of the issue of the OFFICIAL GAZETTE of the Patent and Trademark Office in which the notice concerning the issuance of the registration appears."

"Trademark Registration Treaty. The term "Trademark Registration Treaty" means the Treaty so entitled, done at Vienna, Austria, on June 12, 1973, including the Regulations under the said Treaty."

"International application, international registration, request for the recording of later designation, recording of later designation, International Bureau, regular international application, individual State fee, individual State renewal fee. The terms "international application", "international registration", "request for the recording of later designation", "recording of later designation", "International Bureau", "regular international application", "individual State fee" and "individual State renewal fee" are to be taken in the sense indicated by the Trademark Registration Treaty."

"Owner, Ownership. The terms "Owner" and "Ownership" are to be taken in the sense indicated by the Trademark Registration Treaty where they appear in this Act in capitalized form."

"Owner of a trademark. The term "owner of a trademark" means a person who is using, or who has an intention to use, a trademark in commerce: *Provided*, That no other person, except a lawful concurrent user, has the right to use, and is using or has previously declared, in an application filed under this Act which has not been withdrawn or abandoned, his intention to use, such mark in commerce either in the identical form thereof or in such near resemblance thereto as to be likely, when applied to the goods of such other person, to cause confusion, or to cause mistake, or to deceive."

SEC. 29(a) This Act shall come into force on the same date as the entry into force of the Trademark Registration Treaty with respect to the United States. It shall apply to applications for registration of marks filed in the Patent and Trademark Office on or after such date, even though entitled to an earlier effective filing date, and to registrations issued on the basis of such applications; to international applications and later desig-

nations designating the United States filed with the International Bureau on or after such date, even though entitled to an earlier effective filing date, and to international registrations accorded effects in the United States on the basis of such international applications and later designations; and to proceedings under the Trademark Act of 1946, as amended, commenced on or after such date.

(b) Except as otherwise hereafter provided, applications for registration of marks on file in the Patent and Trademark Office on the date this Act comes into force, registrations issued on the basis of such applications, and proceedings under the Trademark Act of 1946, as amended, which are pending on such date, shall be governed by the provisions of the Trademark Act of 1946, as amended, in effect immediately prior to such date.

(c) Except as otherwise provided hereafter in this section, all registrations under the Trademark Act of 1946, as amended, or under the previous Acts specified in section 46(b) of such Act, existing on the date this Act comes into force shall be governed by the Trademark Act of 1946, as amended, in effect immediately prior to such date.

(d) The provisions of section 9 of the Trademark Act of 1946, as amended, as amended by this Act, shall apply to all registrations under such Act and under the previous Acts specified in section 46(b), whether issued or applied for before, on, or after the date this Act comes into force: *Provided*, that the amendments to such section by this Act shall not apply to the renewal of any registration for any period which started on a date which is earlier than six months after such date.

(e) The amendment by this Act, of the Trademark Act of 1946, as amended, shall not affect any rights or liabilities existing under such Act in effect immediately prior to the date this Act comes into force.

SECTIONAL ANALYSIS

SECTION 1 of the bill amends section 1 of the Trademark Act of 1946, as amended (hereinafter referred to as Trademark Act) [1] in a number of respects. The preamble makes it clear that the commerce clause as well as the treaty power is invoked to support the amendments. Section 1 of the amended Trademark Act is divided into five subsections, each of which is separately discussed below:

Section 1(a) *Entitlement to registration of a trademark.* Entitlement to registration is changed from present law in one fundamental respect. This is that intention to use, as well as actual use of, a trademark is a valid basis for ownership and registration. The other conditions are essentially the same as under present law.

The applicant must be a "person", as defined in section 45. The definition of "person" has not been changed.

As under the present statute, the applicant must be the "owner" of the trademark sought to be registered. The concept of ownership is modified as necessary to be consistent with the new alternative basis of rights. Also, rather than being part of the verified statement, the definition of "owner of a trademark" is in section 45.

The term "owner" is defined, as under present law, in respect of the absence of a superior right in any other person. What is new is that a claim of ownership is defeated not only by the superior right of a prior *user* of the same or a similar mark but also by the superior right of one who has a prior *intention to use* such a mark. However, the latter right can defeat the claim of ownership *only* if the intention to use has been previously declared in an application filed under the Act which has not been withdrawn or abandoned. Accordingly, while a person acquires (absent a superior right) an ownership right by reason of his intention to use a trademark, the right in that case is inchoate and is accorded no protection under the statute and no priority until it has been fixed in an application filed under the Act in which the intention to use is declared. Thus, filing the application is critical to a claim of ownership by intention to use and except, of course, where the Paris Convention "right of priority" (i.e. section 44(d)) is invoked, the filing date is the earliest date on which such a person can rely in a priority contest. (See SECTION 23(c))

Finally, the use or intended use must be in commerce. The definition of "commerce" is not changed. The outside parameters of "intended use in commerce" are left to interpretation just as has been the case with "use in commerce" under the present statute, and the principles that would be applied in such interpretation are essentially the same.

Section 1(b) *Procedure for applying to register a trademark.* Under the amended Act, there are two basic procedures for securing the registration of a trademark, i.e. by filing an application in the Patent and Trademark Office (section 1(b)(1)) and by designating the United States in an international registration pursuant to the Trademark Registration Treaty [2] (section 1(b)(2)). Except for the place where the application is filed and the fee is paid, the substantive requirements applicable to the alternative procedures are essentially the same.

Section 1(b)(1) *Domestic procedure.* In order to achieve harmonization of domestic and international procedures, the following changes are made in the national application procedures.

1. The application may be signed by a representative, duly appointed by the applicant, as an alternative to signing by the applicant himself. The same benefit is provided to applicants filing under the Trademark Registration Treaty (Article 26).

2. Consistent with the requirements of the Trademark Registration Treaty and modern practice in regard to the filing of statements with federal agencies the verification of ownership requirement has been eliminated.

Of course, the criminal provisions of 18 U.S.C. 1001 would remain applicable to a statement made in a trademark application irrespective of whether such statement is verified.

3. The applicant need not allege use of the mark in his application. The Trademark Registration Treaty prohibits such a requirement (Article 19(3)(a)) for the owners of international registrations; consequently, the same benefit is accorded to persons filing regular national applications. Substituted for this requirement is the declaration of intention to use the mark in commerce, which *is* permitted by the Treaty (Article 19(4)). Consistent with this change, specimens or facsimiles of the mark as actually used need not be submitted with the application.

It should be noted that required allegations and exhibits relating to actual use according to the present statute are

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[1] Public Law 489, 79th Congress, approved July 5, 1946; 60 Stat. 427. Amendments have been effected by the following public laws.
P.L. 710, 81st Cong., 64 Stat. 459, 8–17–50.
P.L. 593, 82nd Cong., 66 Stat. 792, 7–19–52.
P.L. 609, 85th Cong., 72 Stat. 540, 8–8–58.
P.L. 333, 87th Cong., 75 Stat. 748, 10–3–61.
P.L. 772, 87th Cong., 76 Stat. 769, 10–9–62.
P.L. 89–83, 89th Cong., 79 Stat. 260, 7–24–65.
P.L. 93–596, 93rd Cong., 88 Stat. 1949, 1–2–75.
P.L. 93–600, 93rd Cong., 88 Stat. 1955, 1–2–75.

[2] Done at Vienna, Austria, June 12, 1973. This is the Treaty which was transmitted by the President to the Senate for advice and consent to ratification on September 3, 1975. *Congressional Record* 9/3/75, S. 15139.

retained in section 1(c). It should also be noted here that the applicant *may* file the section 1(c) declaration together with his application (section 1(c)(2)), if the mark is already in use in commerce. In such case, the declaration of intention to use is obviously superfluous and need not be made.

Section 1(b)(2) *International procedure.*

This paragraph states the requirements which must be satisfied in order to secure the effect of a United States application, i.e. the effect required by the Trademark Registration Treaty (Article 11(1)).

The provisions of Article 19(4) of the Treaty, requiring a declaration of intention to use, are also implemented, corresponding to the same requirement in section 1(b)(1)(C) for domestic applicants.

Finally, a special requirement as to entitlement of a foreign applicant to use the Trademark Registration Treaty (Article 4) has been added since the International Bureau will only examine this question formally, leaving it to the designated States to examine it as to substance. Thus, non-entitlement of a foreign applicant to use the Treaty procedure is a ground for refusal (Article 12(1)(ii)) or cancellation (Article 13(1)(ii)) in addititon to the grounds applicable under the national law.

The final two sections of section 1(b) implement part of Article 9 of the Treaty whereunder the improper declining of an international application or later designation request by the International Bureau can be rectified by filing a regular domestic application within 2 months from the notice of the declining.

Section 1(c) *Declaration of use.*

Section 1(c) calls for a declaration of use showing that use of the mark commenced on or prior to the date of expiration of three years, counted from the filing date. Paragraph (1) requires the declaration to contain essentially the same information as that required by present section 1.

Paragraph (2) prescribes a time limit of four years, counted from the filing date, within which the declaration may be filed, and indicates the consequences of failure to file an acceptable declaration.

Paragraph (3) authorizes the Commissioner to require the earlier filing of a declaration when important relative to an issue in any Office proceeding, provided that the three-year period has expired.

Paragraph (4) prevents abuse of the intention to use provisions by a person filing successive applications for the same, or a substantially equivalent, mark by providing that, unless there is a gap of at least two years between the expiration of the nonuse moratorium of the earlier case and the date of filing of the later case, the three-year period in the later case is measured from the filing date of the earlier case. Any subsequent application which is accompanied by a declaration of use is excluded from the special provisions.

Paragraph (5) provides for an extension of the time limits when due to extraordinary circumstances nonuse is excusable. The proviso expressly states, however, that the mere pendency of the application for registration as of the expiration of the three-year period shall not justify an extension, making it clear that Article 19(3)(b) of the Trademark Registration Treaty does not apply in the United States.

Paragraph (6) requires the Commissioner to give notice regarding acceptance or refusal of a declaration.

Section 1(d) *Special requirement for concurrent use applications.*

This provision, unchanged from present law, is placed in a separate subsection because its applicability is limited to applications wherein the section 1(c) declaration of use has been filed.

Section 1(e) *Special requirement for applicants not domiciled in United States.*

This subsection requires all applicants not domiciled in the United States to designate an agent for service on or prior to the institution or defense of a proceeding under this Act. Before a local agent for service has been designated, service may be made upon the Commissioner.

SECTIONS 2 and 3 of the bill amend sections 3 and 4 of the Trademark Act so that service marks and collective and certification marks may be registered based on either use or intention to use.

SECTION 4 of the bill amends section 5 of the Trademark Act to provide that the intended use by a related company inures to the benefit of the registrant or applicant.

SECTION 5(a) of the bill amends section 7(a) of the Trademark Act to take into account the fact that registrations issued on the basis of intent applications would not, if the declaration of use has not been filed, contain any data concerning use of the mark. In such cases, the fact that the declaration has not been filed would be indicated in the registration in lieu of the indications as to use. Also, the term "date of the registration" has been deleted, the significant dates under the amended statute being the "filing date" and the "date of issue."

SECTION 5(b) amends section 7(a) by requiring a notice of registration to be published in the OFFICIAL GAZETTE in support of the definition of "date of issue" in section 45.

SECTION 5(c) amends section 7(b) of the Trademark Act by deleting the presumption of the registrant's exclusive right to use the registered mark in commerce on the goods specified in the registration. One reason is that this presumption in the present statute is repeated in section 33(a).

The other reason is that this presumption, as it pertains to infringement actions, must be limited to be consistent with the limitation on the right even to file an infringement action prior to the commencement of use (see SECTION 23(a)).

Deletion of the "exclusive right to use" presumption from section 7(b) leaves a gap in the statute, however, the bringing of Patent and Trademark Office proceedings, i.e. oppositions and cancellations is not subject to the above mentioned limitation. The exclusive right to use presumption has served in such proceedings as the basis of the ruling that a registrant is entitled to rely solely upon his registration on the principal register as prima facie evidence of his right to exclude any other person from securing a registration under the Act of a confusing mark. Therefore, a presumption as to this right has been added.

SECTION 5(d) of the bill amends section 7(d) by adding two new paragraphs which provided domestic and international procedures, consistent with present law and with the Treaty, for amending a registration in respect of the specification of goods and/or services.

SECTION 5(e) of the bill amends section 7 by adding a new subsection, section 7(h), providing for appropriate notification, consistent with Article 20 of the Treaty, with respect to entries concerning registration based on international registrations.

SECTION 6 of the bill amends section 8(a) of the Trademark Act by changing the term of a registration from 20 to 10 years and the date from which the terms is measured from the registration date to the filing date. These changes correspond the term of domestic registrations to that of registrations secured under the Trademark Reg-

istration Treaty. The shorter term also facilitates the clearing from the register of unused marks.

The section is also amended to require that the use declared in the affidavit or declaration set forth in the proviso, i.e. the present section 8 affidavit, be use "in commerce".

Finally, the section is amended to permit, consistent with the requirement in the Treaty (Article 19(3)(d)), that such affidavit or declaration requirements be capable of being fulfilled in the case of an international registration by filing with the International Bureau.

SECTION 7 of the bill amends section 9 of the Trademark Act to set forth domestic and international procedures for renewal and to provide equivalent treatment, as to substantive requirements, of international and domestic registrants. Thus, as in the case of an application for registration, the renewal application may be signed by a representative, duly appointed by the registrant.

Two changes are made in the statute which conform to the Treaty, as follows:

1. The term of renewal is 10 years rather than 20, consistent with the Treaty (Article 17).
2. The time period, counted from the expiration date of the expiring term, in which a late renewal application can be filed is increased from three months to six months, corresponding to Article 17(3)(a).

Section 9(c) requires a declaration of use which requirement is applicable to all renewed registrations. Other than the three additional months in which to declare use of the mark, the only difference from present law is that the consequence of failure to satisfy the requirement is cancellation of the registration rather than refusal to renew.

SECTION 8(a) of the bill amends section 10 of the Trademark Act in several minor respects. Except for a technical change, the present provision for recording of assignments (section 10) is not changed.

Three new paragraphs have been added to the assignment section. The first two of these (i.e. 10(a)(2) and 10(a)(3)) implement Article 14 of the Treaty, under which a change in the ownership of an international registration may be recorded, by adding equivalent procedures to the national law. Thus, any applicant or registrant may record the fact that a new person has become the owner of an application filed or registration issued under the Act by complying with certain basic formalities. Paragraph (3) provides that if this step is taken within the period specified in paragraph (1) and it is followed up by the recording of instruments of assignment conforming to the requirements of paragraph (1), the constructive notice effect of recording an assignment in the Office will accrue.

The third additional paragraph (i.e. 10(a)(4)) is a special provision, implementing Article 14(5), for the benefit of one who, although not entitled to file under the Treaty, becomes the owner of an international registration by operation of law (e.g. by inheritance). Such a person may, subject to special requirements, rectify this defect by filing a regular national application.

SECTION 8(b) of the bill amends section 10 of the Trademark Act by adding two new provisions. The first of these (Section 10(b)) adds a new procedure, consistent with Article 15 of the Treaty, for recording a change in the name of the registrant.

Subsection (c) is added to clarify the procedure where a recording is void. Recordings under subsections (a) and (b) may later be determined to be void or contrary to law in another proceeding (cancellation, infringement action, etc.) under the Act. A specific provision has been added to clarify the fact that the Commissioner has the authority to correct the records and to provide a basis for denial of any international recording which formed the basis of the national entry.

SECTION 9 of the bill amends section 12(a) of the Trademark Act to provide for a "cut off" in the length of the ex parte examination of twelve months counted from the filing date of the application. Under amended section 12(a) all applications, the examination of which has not been completed, would have to be published for opposition purposes no later than 12 months from the filing date.

The reason for 12 months as the "cut off" is that the time required to effect publication, to receive oppositions (including delays in processing oppositions received on the last day), and to communicate, in the case of international registrations, all grounds of refusal or possible refusal to the International Bureau, must be taken into account in order to meet the deadlines prescribed by the Treaty (see Article 12).

It should be noted that the exact schedule for publication is left to determination by the Commissioner. There are, at least, two possibilities: (1) publication, promptly after filing, of all applications; and (2) publication (of allowed cases) after completion of the ex parte examination (as at present), or (of all still pending cases) at the expiration of 12 months, whichever event is the earlier to occur.

SECTION 10 of the bill amends section 12(b) of the Trademark Act by reducing the period of time in which to reply to an Office communication concerning the application from six to three months and by providing a time limitation applicable to notifying the applicant of grounds raised during the ex parte examination. The reduction of response time should make it possible for the Office to complete the ex parte examination of most applications within the 12 months period of amended section 12(a).

The cut off is the same as the one in amended section 12(a), i.e. 12 months, counted from the filing date. The examination need not be completed within the 12 months as the Treaty requirement is only that all grounds be communicated within that period. Also, the limitation would not apply to a new ground of refusal based on a decision of the Trademark Trial and Appeal Board or of a court.

SECTION 11 of the bill amends section 13 of the Trademark Act by providing for a time limit of 14 months for receiving oppositions. The 14 month time limitation ties in with the amendment to section 12(a) of the Act, providing equivalence of treatment of domestic and Treaty applicants. Section 13 is also amended to provide that an attorney may file an opposition on behalf of the opposer.

SECTION 12 of the bill amends section 14 of the Trademark Act in two respects, conforming this section to amended section 13, and a minor change in terminology ("date of issue").

SECTION 13 of the bill amends section 15 of the Trademark Act by a minor change in terminology ("date of issue").

SECTION 14 of the bill amends section 16 of the Trademark Act by providing specifically that an interference may be declared as to any particular application for registration of a mark only prior to the publication for opposition of that mark. While this is no different than current practice, the change in the statute seemed desirable. Since the declaration of an interference would constitute a ground of possible refusal under the Trademark Registration Treaty, such ground would have to be notified to the International Bureau within the prescribed time limit.

By requiring the declaration of the interferences prior to the date of publication, the section is subject to the same time limitation as in amended section 12(a), i.e. 12 months from the filing date.

SECTION 15 of the bill amends section 17 of the Trademark Act by providing discretionary authority to the Commissioner to defer the commencement of certain inter partes proceedings where the ex parte examination of a concerned application is not complete.

SECTION 16 of the bill amends section 21 of the Trademark Act by providing for an appeal from a refusal to accept a declaration pursuant to sections 1(c) and 9(c), as is now provided in the case of refusal of a section 8 affidavit.

SECTION 17 of the bill makes a language change in section 22 of the Trademark Act, consistent with the change from "date of registration" to "date of issue". Thus, constructive notice begins with publications of issuance of the registration (date of issue), no different in substance than under present law.

SECTION 18 of the bill amends section 23 of the Trademark Act by eliminating the requirements and provisions relating to use in the first and fourth paragraphs. Also, provision is made for treatment of applications as being under this section only where the application or the international registration (or recording of later designation) so indicates. The specific reference implements Article 11(3) which requires this treatment in the case of international registrations.

SECTION 19(a) of the bill amends section 24 of the Trademark Act by deleting the requirement that a petition to cancel a registration on the Supplemental Register be verified (consistent with amended section 14).

SECTION 19(b) of the bill amends section 24 of the Trademark Act by limiting the authority to cancel a registration on the Supplemental Register for nonuse, consistent with the use moratorium of the Treaty.

SECTION 20 of the bill amends section 30 of the Trademark Act in minor respects to remove an incidental reference to use of a mark that is inconsistent with amended section 1.

SECTION 21(a) of the bill amends section 31 of the Trademark Act by deleting the requirement of a fee for the filing of a section 8 affidavit. Since a section 8 fee cannot be assessed against a registration issued on the basis of an international registration (Article 19(1)), it is deleted in order to provide equivalence between domestic and Treaty applicants as to fees payable to the United States.

SECTION 21(b) of the bill amends section 31 of the Trademark Act by adding new subsection (d) whereby the filing and renewal fees are deemed to be substituted for by the corresponding fees set forth in the Treaty, where the international procedure is followed. This provision also obligates the Commissioner to fix the Treaty fees at the same amounts as the national fees.

SECTION 22 of the bill amends section 32(1) of the Trademark Act by providing that no infringement action may be started under the Act until the declaration of use of the mark in commerce has been filed in the Patent and Trademark Office and accepted by the Commissioner. This change implements the last sentence of Article 19(3)(a). Examination of the declaration could be accelerated if the registrant faced an impending infringement situation.

SECTION 23(a) of the bill amends section 33(a) of the Trademark Act so that the presumption of exclusive right to use the mark would apply as a rule of evidence only as to those goods and/or services in respect of which the mark is stated to be in use in commerce either in the registration itself or in the declaration under section 1(c).

SECTION 23(b) makes some minor changes in the language of section 33(b).

SECTION 23(c) amends section 33 of the Trademark Act by adding a new subsection (c) to define priority of rights accorded to applications or registrations based on an intention to use the mark. Under new subsection (c), the priority of an intent applicant or registrant would be *the same as if* he had commenced use of the mark in commerce on the filing date, unless, of course, he had an earlier priority based on use or based on the Paris Convention priority provisions of section 44(d) of the Act.

SECTION 24 of the bill amends section 35 of the Trademark Act in order to implement the last sentence of Article 19(3)(a) so that the remedies of profits and damages cannot date back prior to the date of commencement of use.

SECTION 25 of the bill renumbers present section 44(a) of the Trademark Act as section 44(a)(1) and adds to it some special provisions relating to the Trademark Registration Treaty.

Paragraph (2) authorizes the Commissioner to keep a register of international registrations designating the United States.

Paragraph (2) also contains a broad implementing provision, authorizing the Commissioner to take various actions prescribed by the Treaty. While all of the essential Treaty provisions parallel to provisions concerning domestic applications and registrations have been specifically implemented, a large number of Treaty provisions remain which solely concern the international procedures.

Paragraph (3) prescribes a procedure for communicating notifications where the deadline is stated in terms of the date of receipt by the International Bureau, most importantly the notification of refusal or possible refusal under Article 12(2)(a)(i).

Paragraph (4) implements Article 11(2)(i) of the Treaty providing for automatic registration as of the date of expiration of the time limit fixed in Article 12(2)(a)(i) where no notification of refusal or possible refusal has been received by the International Bureau.

Paragraph (5) implements Article 29 of the Treaty whereby certain delays in meeting the time limits fixed in the Treaty must be waived and others may be waived. There are some specific exceptions in the Treaty which is the reason for the last clause in this paragraph.

SECTION 26 of the bill amends section 44(c) of the Trademark Act by deleting the first sentence of this subsection. Since a person can secure a registration based on an intention to use the mark in commerce, the sentence is inconsistent with the amended Act. However, the sentence is no longer necessary. Under the amended Act all applicants would be required to declare use or an intention to use in commerce, whether or not the mark is also registered in the country of origin.

SECTION 27 of the bill deletes present subsection 44(d) of the Trademark Act and substitutes therefor a subsection providing that a right of priority may be based on a first international application as well as a first national application. Paragraph (2) of present subsection (d) is not continued. Waiver of use in commerce is no longer necessary since an application need not allege use under the amended Act. Old paragraph (4) (new paragraph (3)) of the subsection is amended to be consistent with the first sentence of section 44(c).

SECTION 28(a) of the bill amends the definitions, in section 45 of the Trademark Act, of the terms "trademark,"

"service mark," "certification mark," "collective mark" and "Intent of Act" by adding the phrase, "or intended to be used" in appropriate places consistent with the new basis for securing registrations.

SECTION 28(b) of the bill amends the definition, in section 45 of the Trademark Act, of "abandonment" to provide for abandonment of a mark applied for based on an intention to use where no use is commenced and there was never any intention to commence use. The two year prima facie abandonment provision is amended to make it clear that it applies only where use of a mark is discontinued.

SECTION 28(c) of the bill amends section 45 of the Trademark Act by adding the following new definitions:

(1) "Filing date" is defined because of its significance in respect of priority of rights in the case of an application or registration based on the intention to use;

(2) "Date of issue" is defined;

(3) "Trademark Registration Treaty" is defined;

(4) Various terms used in respect of the Trademark Registration Treaty are referenced to the Trademark Registration Treaty definitions;

(5) The terms "Owner" and "Ownership," used in capitalized form are referenced to the Trademark Registration Treaty.

This was done in order to distinguish these references from other references in the statute to "owner" or "ownership" which refer to the owner, or ownership, of a mark.

Finally, the term "owner of a trademark" is defined. The reason for this definition is discussed under SECTION 1, infra.

SECTION 29 of the bill prescribes the implementation of the various changes effected by the bill. The effective date of the Act coincides with the entry into force of the Treaty with respect to the United States. Appropriate provisions specify the controlling law which is applicable before, or on or after, the effective date.

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(117) TRADEMARK APPLICATIONS UNDER SECTION 44 OF THE TRADEMARK ACT OF 1946

[37 CFR Parts 2 and 4]

Withdrawal of Proposed Rules

AGENCY: Patent and Trademark Office, Commerce.

ACTION: Withdrawal of proposed rules.

SUMMARY: The Patent and Trademark Office hereby withdraws its rule proposals (FR Doc. 77-23095 published in the Federal Register on August 10, 1977, 42 FR 40450; 962 TMOG 2-4, September 6, 1977) regarding applications filed under section 44 of the Trademark Act of 1946.

Under the proposed rules, foreign applicants filing under section 44 (d) or (e) of the Trademark Act of 1946, as amended, 15 U.S.C. 1126, would no longer have been required to allege use of the mark somewhere or to submit specimens or facsimiles demonstrating such use.

The primary consideration for the withdrawal of this rules proposal was the strong objection voiced by several commenters that the proposed rule changes would have placed some United States nationals in a less favorable position than foreign nationals than is the case under the present rules.

EFFECTIVE DATE: June 30, 1978.

FOR FURTHER INFORMATION CONTACT: J. Paul Williamson, Patent and Trademark Office, 703-557-2521.

SUPPLEMENTARY INFORMATION: A notice was published in the OFFICIAL GAZETTE of the United States Patent and Trademark Office on April 30, 1974 (921 OG TM 250) detailing the procedure being followed by this Office in connection with applications filed under section 44 of the Trademark Act of 1946 without specimens and without a statement of use of the mark. That notice is hereby withdrawn and the procedure thereunder terminated. Henceforth, in order to receive a formal filing date, an application under section 44 must include in the application at least one specimen and a statement that the mark has been used.

Those applicants having cases now under suspension in this Office in accordance with the April 1974 OFFICIAL GAZETTE notice will be notified individually of the Office policy regarding specimens and use as set out above.

Finally, the withdrawal of this rules proposal should in no way be interpreted as a diminution of the continuing support of the Department of Commerce and this Office for the Trademark Registration Treaty. Under that Treaty it will be possible to treat all applicants, foreign and domestic, equally in regard to initial use requirements for filing an application for trademark registration in the United States Patent and Trademark Office.

Dated: June 16, 1978.

DONALD W. BANNER,
Commissioner of Patents and Trademarks.

Approved:

JORDAN J. BARUCH,
Assistant Secretary for Science and Technology.

[FR Doc. 78-18301; Filed 6-29-78; 8:45 am]

[978 TMOG 19 (Aug. 1, 1978)]

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(118) TITLE 37—PATENTS, TRADEMARKS, AND COPYRIGHTS

CHAPTER 1—PATENT AND TRADEMARK OFFICE, DEPARTMENT OF COMMERCE

PART 2—RULES OF PRACTICE IN TRADEMARK CASES

Late Filed Fees for Section 8 Affidavits/Declarations and Notices of Opposition in Trademark Cases

AGENCY: Patent and Trademark Office, Commerce.

ACTION: Final rule.

SUMMARY: This notice adopts rule changes which permit the acceptance of late fees in connection with notices of opposition and affidavits or declarations under § 8 of the act of July 5, 1946, as amended. These changes eliminate the need for petitioning the Commissioner for acceptance of such late fees. Under these changed rules, the Office will notify parties of the missing or deficient fees and provide for the acceptance of the appropriate fee within a designated time period upon payment of a service charge.

EFFECTIVE DATE: September 11, 1978.

FOR FURTHER INFORMATION CONTACT: J. Paul Williamson, Patent and Trademark Office, 703-557-2521.

SUPPLEMENTARY INFORMATION: On February 2, 1978, the Patent and Trademark Office published for comments a proposal (43 FR 4441, FR Doc. 78-2922) to revise §§ 2.1, 2.6, 2.101 and 2.162 of title 37 of the Code of Federal Regulations. Ten written comments were received in connection with the proposed changes and these written comments, together with an analysis of the comments, are available for public inspection in room 11E10 of Crystal Plaza Building 3, 2021 Jefferson Davis Highway, Arlington, Va. All comments were given careful consideration in the preparation of these final rules.

The only comment received which opposed the proposed rulemaking expressed the opinion that timely payment of a fee for at least one class was mandated by the statute in connection with an affidavit or declaration under § 8 and with an opposition.

Section 31 of the statute sets the required fees for the majority of activities in the Trademark Operation. However, it was held in "In re Kleiner," 185 USPQ 362 (Comr. Pat. 1975) that this section of the statute does not preclude the payment of a fee beyond the time allowed for filing a § 8 affidavit or declaration. Section 31 is not construed to require the "timely" filing of any fee. That section only determines the amount of the fee which must be paid. When the necessary fee must be paid is determined from other sections of the statute, that is, the particular sections dealing with the activity for which a fee is required.

Section 8 of the statute makes no reference to a fee and therefore there is no statutory mandate regarding the timeliness of such fee. Likewise, § 13 of the Statute does not preclude the payment of the required fee beyond the time allowed for filing the opposition. See *"Colgate-Palmolive Co. v. Brenner, Comr. of Pats."*, 148 USPQ 535 (S.D.N.Y. 1965) and

"Marzall, Comr. of Pats. v. *Libby, McNeill and Libby,"* 89 USPQ 10 (D.C. Cir. 1951).

Finally, the comment opposing the rules changes expressed the concern that these changes may increase the administrative burden on the Patent and Trademark Office and, in a sense, encourage inattention to compliance with the act and the rules by some parties. With respect to the administrative burden on this Office, it is believed that the new procedures can be handled more efficiently and with less burden on the Office than the petition process now requires. Furthermore, as indicated in the proposed rules notice, the handling of such fees is considered to be of a ministerial nature and it is not believed that substantive rights should be immediately denied due to a failure to comply with a requirement of that nature. However, where the proposed procedure is not complied with, relief by way of petition to the Commissioner will require that the stringent standards of § 2.148 be satisfied.

One of the comments favoring the proposed changes also recommended that § 2.85(e) be amended to delete reference to the § 8 and opposition fees and to incorporate the concept of that rule into §§ 2.101 and 2.162. The basis of this suggestion was that the concept of § 2.85(e) does not logically fit with the other elements of § 2.85 and since changes are being made with §§ 2.101 and 2.162, it would make better sense to add this concept to those rules. While there is merit to the suggestion that the concept of § 2.85(e) does not logically fit with the other elements of § 2.85, it is believed that attorneys and other parties regularly practicing before this Office are now well aware of § 2.85(e). In those cases where parties are not aware of § 2.85(e), the Office notification of a deficiency of fees for the number of classes involved sufficiently alerts parties such that no prejudice results rom the "location" of the concept within the rules themselves. Therefore, rather than trying to embody the concept in five different rules covering fees for appeals, oppositions, cancellations, renewals and § 8 affidavits or declarations, it is considered more efficient to leave § 2.85(e) as is. However, the suggestion of this commenter that the revision to § 2.1 should include a reference to § 2.85(e) is valid and that change has been incorporated into the final rule.

Accordingly, pursuant to the authority contained in §§ 31 (b) and 41 of the act of July 5, 1946, as amended, the proposed amendments to the rules of practice, with the change noted above, are adopted as set forth below.

1. By revising § 2.1 to read as follows:

§ 2.1 *Sections of Part 1 applicable.*

Section 1.1 to 1.26 of this chapter are applicable to trademark cases except such parts thereof which specifically refer to patents and except § 1.22 to the extent that it is inconsistent with §§ 2.85(e), 2.101(c) or 2.162(d). Other sections of part 1 incorporated by reference or referred to in particular sections of this part are also applicable to trademark cases.

2. By the addition of new paragraph (g) to § 2.6 to read as follows:

§ 2.6 *Trademark fees.*

* * * * *

(g) For the special service of handling late filed fees in connection with an:

Affidavit or declaration under § 8	10.00
Opposition	25.00

* * * * *

3. By the addition of new paragraph (c) to § 2.101 to read as follows:

§ 2.101 *Filing an opposition.*

* * * * *

(c) If no fee, or a fee insufficient to cover at least one class, is filed within 30 days after publication of the mark to be opposed or within an extension of the time for filing an opposition, the opposition will not be refused if the required fee(s) and service charge (see § 2.6(g)) are filed in the Patent and Trademark Office within the time limit set forth in the notification of this defect by the Office. In situations covered by this paragraph, § 2.85(e) may not be utilized.

4. By revising paragraph (d) of § 2.162 to read as follows:

§ 2.162 *Requirements for affidavit or declaration during sixth year.*

* * * * *

(d) Include the required fee for each class to which the affidavit or declaration pertains in the registration. If no fee, or a fee insufficient to cover at least one class, is filed before the expiration of the sixth year following the date of registration or of publication under § 12(c) of the act, the affidavit or declaration will not be refused if the required fee(s) and service charge (see § 2.6(g)) are filed in the Patent and Trademark Office within the time limit set forth in the notification of this defect by the Office. In situations where a notice of deficiency is sent because no fee, or a fee insufficient to cover at least one class, is filed, § 2.85(e) may not be utilized. If insufficient fees are included to cover all classes in the registration, the particular class or classes to which the affidavit or declaration pertains should be specified;

* * * * *

Dated: July 28, 1978.

DONALD W. BANNER,
Commissioner of Patents and Trademarks.

Approved:
FRANCIS W. WOLEK,
Acting Assistant Secretary for Science and Technology.

[FR Doc. 78-22330; Filed 8-9-78; 8:45 am]

[974 TMOG 6 (Sept. 12, 1978)]

(119)

Title 37—Patents, Trademarks, and Copyrights

CHAPTER I—PATENT AND TRADEMARK OFFICE, DEPARTMENT OF COMMERCE

PART 4—FORMS FOR TRADEMARK CASES

AGENCY: Patent and Trademark Office, Commerce.

ACTION: Final rule.

SUMMARY: The Patent and Trademark Office adopts revisions to the suggested forms for use in trademark cases. These revisions are intended to improve suggested forms which had been found to be confusing or susceptible to misinterpretation and provide a new suggested form to eliminate the need for the user to combine two forms.

DATES: Effective date: January 1, 1979.

FOR FURTHER INFORMATION CONTACT:

Miss Katharine I. Hancock by telephone at (703) 557-5380, or by mail marked to her attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

SUPPLEMENTARY INFORMATION: In the FEDERAL REGISTER of May 3,

1977 (42 FR 22378) there was published a Patent and Trademark Office proposal to revise certain existing forms and provide one new form for trademark cases. Comments were received from six persons. Two persons suggested that the the word "swears," proposed at the beginning of verifications and affidavits, was not appropriate and that language relating to oath should be confined to the jurat. This suggestion has been adopted. It was suggested by two persons that double signatures be eliminated from the forms for opposition and petition to cancel, and this suggestion has been adopted. Also, after further consideration with the object of eliminating confusion, inconsistency and error from the forms, some additional changes to forms set out in the proposal, and to forms 4.7, 4.9, 4.11 and 4.23 which were not included in the proposal, are being adopted.

Changes which have not been published for comment do not represent any change in practice but are editorial in nature and do not impose a burden on anyone; further opportunity for comment is therefore deemed not necessary.

The ways in which the changes being adopted vary from the published proposal are summarized as follows:

The words "hereby swears" proposed at the beginning of verifications and affidavits are replaced by the word "states." This change appears in forms 4.1, 4.5, 4.6, 4.13, 4.14, 4.15, 4.16, 4.16 (Combined 8 & 15), 4.17 and 4.18.

In forms 4.1, 4.1a 4.7, 4.8, 4.9 and 4.10, where goods or services are set forth, the terms "(Common, usual or ordinary name of (goods or services))" and "(Insert illustrative examples of the goods or services)" are deleted and the term "the following (goods or services):" is inserted instead, although the format of form 4.8 makes it necessary to use the variation "Name the goods or services."

In forms 4.1 and 4.1a, the term "trade style" is deleted and "business trade name" put in its place in identifying an individual applicant in order to conform more closely to the language of the statute. The wording "including street, city and State" is deleted from the address lines. The same changes have been made, where appropriate, in forms 4.17 and 4.18.

In form 4.1a, last clause, the word "herein" is deleted as unclear; the word "further" and the last occurrence of the word "that" are deleted as unnecessary.

In form 4.5, "firm" is changed to "partnership" as a more definite term for the entity for which the form is designed; "member of firm" is changed to "partner;" and the wording "including street, city and State" in the address, as well as the wording and space for domicile, are deleted.

In form 4.6, the proposed change of the word "affidavit" to "application" in the verification is not adopted; instead, the word "affidavit" is changed to "instrument" because the paper being executed contains both an application and an affidavit (verification) and the term "instrument" will encompass both. The wording "including street, city and State" in the address is deleted.

In forms 4.8 and 4.10, footnote (5) is replaced by new footnote (16) in order to clarify instructions for setting forth the manner of use of the mark; as a result, present footnote numbers (16), (17) and (18) in companion forms 4.9 and 4.11 are changed to numbers (17), (18) and (19), respectively.

In form 4.8, last sentence, the words "declaration from form" are inserted before "4.1a" in order to make it clear that form 4.1a is a declaration form.

In form 4.9, in the heading, the words "(If known)" under Class No. are replaced by "(A, for Goods; B, for Services)" in view of the fact that those are the only classes for certification marks. The term "(or form 4.7)" is placed after "footnote (5)" to accommodate either goods or services. For the sake of clarity, footnote (17) which explains certification has been reworded slightly.

In form 4.10 the phrase "Use form 4.1" is changed to "Use body of form 4.1, 4.7 or 4.8" in order to be more clear and to accomodate services and collective mark situations; under "Notes," reference is made to form 4.8 in addition to form 4.1 for the same reason.

In form 4.13, the statement in the verification "that the applicant for renewal owns the above identified registration" is deleted as it constitutes repetition.

In forms 4.13 and 4.16, where goods are listed, the words "or services" and "or 'all the services' " are added, where appropriate, to accommodate services as well as goods.

In forms 4.13, 4.14, 4.15 and 4.16 (Combined 8 & 15), in the Note relating to designation of a domestic representative, for purposes of clarity the word "made" is changed to "submitted with this form" and the word "prior" is added before "unrevoked."

In forms 4.13, 4.17 and 4.18, in the caption under the line where the signer's name is to appear, the words "a juristic" are added after the phrase "to sign for," and in the body of forms 4.17 and 4.18, the word "juristic" is added after the phrase "to sign for the." The purpose of these changes is

to make clear who is an authorized signer and to provide uniformity with other forms.

In form 4.14, footnote (3) is deleted. The footnote relates to services but this form is not applicable to services because registration of service marks was not available under the acts to which the form pertains. Footnote numbers (4) and (5) are changed to numbers (3) and (4), respectively. Immediately above the signature, the notation footnote (3) (inadvertently omitted) is inserted.

In forms 4.14 and 4.16, in the clause for listing goods or services, the word "recited" is replaced by "stated," to conform to the language of the statute.

Proposed new form 16(a) has been redesignated as form 16 (Combined 8 & 15), in order to coordinate properly with the numbering system used for the forms.

The following changes are made in new form 16 (Combined 8 & 15): after "footnote (5)" in the body of the form, "recited" is replaced by "stated" to conform to the language of the statute; under the space for listing goods, wording is added to accommodate services as well as goods; before "footnote (4)" in the body of the form the wording "or the date of publication under section 12(c) of the act" (inadvertently omitted) is inserted; and after the phrase "that such mark is still in use" the wording "in (3) ———— (Type of commerce) commerce" (inadvertently omitted) is inserted.

Forms 4.17 (Opposition) and 4.18 (Petition to cancel) are made single signature forms by deletion of the provision for signature at the end of the body of the form, leaving a signature only at the end of the verification. This accords with forms for applications, which also require only a single signature at the end of the verification or declaration. In the verification of forms 4.17 and 4.18, the words "the foregoing" (two occurrences) are replaced by the word "this," and the words "and signed" which follow the words "has read" are deleted.

In the parenthetical sentence relating to grounds of damage, the word "he" is changed to "opposer" or "petitioner" in each form, respectively.

In form 4.21, first sentence, "he" is replaced by "said assignor."

In forms 4.21 and 4.22, third paragraph, the letter "s" is deleted from the word "rights." At the end of footnote (2) the wording "changing the word 'applicant' to 'assignee' " is added.

The words "he," "himself" and "his" have been replaced by "he/she," "himself/herself," "his/her" or "it/he/she," as appropriate, in forms 4.1, 4.1a, 4.5, 4.6, 4.13, 4.17, 4.18, 4.21 and 4.22, to give choice of gender.

In form 4.23 (Certificate of mailing), the first line at the bottom is labeled "Print or Type Name of Person Signing Certificate" and the second line is labeled "Signature of Person Signing Certificate," in order to make it clear that in addition to a person's signature, such person's name is to be set out legibly in typing or printing; under the third line, the words "of Signature" are added after "Date" to distinguish the date of signature clearly from the date of deposit which is to be set forth in the body of the form. In the heading of the form, the words "of mailing" are added after "Certificate" for the sake of clarity.

Accordingly, pursuant to the authority contained in section 41 of the act of July 5, 1946, as amended, 37 CFR Part 4 is amended as follows:

1. By revising § 4.1 to read as follows:

§ 4.1 Trademark application by an individual; Principal Register with oath.

Mark ————————————————
(Identify the mark)

Class No. ————————————————
(If known)

TO THE COMMISSIONER OF PATENTS AND TRADEMARKS:

.....
(Name of applicant, and business trade name, if any)

.....
(Business address)

.....
(Residence address)

.....
(Citizenship of applicant)

The above identified applicant has adopted and is using the trademark shown in the accompanying drawing (1) for the following goods:

————————————————,

and requests that said mark be registered in the United States Patent and Trademark Office on the Principal Register established by the Act of July 5, 1946.

The trademark was first used on the goods (2) on ————(Date); was first used in ———— (Type of commerce) commerce (3) on ————(Date); and is now in use in such commerce.

(4)

The mark is used by applying it to (5) ———— and five specimens showing the mark as actually used are presented herewith.

(6)

State of ————
County of ———— } ss.

————————————————
(Name of applicant)

states that he/she believes himself/herself to be the owner of the trademark sought to be registered; to the best of his/her knowledge and belief no other person, firm, corporation or association has the right to use said mark in commerce, either in the identical form or in such near resemblance thereto as to be likely, when applied to the goods of such other person, to cause confusion, or to cause mistake, or to deceive; and the facts set forth in this application are true.

_____

(Signature of applicant)

JURAT:

Subscribed and sworn to before me, this —— day of ————, ——.

_____

Notary Public

*The person who signs the jurat must be authorized to administer oaths by the law of the jurisdiction where executed, and the seal or stamp of the notary, or other evidence of authority in the jurisdiction of execution, must be affixed.

REPRESENTATION

(See form 4.2 and Note (7) below.)

NOTES

(1) If registration is sought for a word or numeral mark not depicted in any special form, the drawing may be the mark typed in capital letters on letter-size bond paper; otherwise, the drawing shall comply with section 2.52.

(2) If more than one item in a class is set forth and the dates given for that class apply to only one of the items listed, insert the name of the item to which the dates apply.

(3) Type of commerce should be specified as "interstate," "territorial," "foreign," or other type of commerce which may lawfully be regulated by Congress. Foreign applicants relying upon use must specify commerce which Congress may regulate, using wording such as commerce with the United States or commerce between the United States and a foreign country.

(4) If the mark is other than a coined, arbitrary or fanciful mark, and the mark is believed to have acquired a secondary meaning, insert whichever of the following paragraphs is applicable:

(a) The mark has become distinctive of applicant's goods as a result of substantially exclusive and continuous use in ———— (Type of commerce) commerce for the five years next preceding the date of filing of this application.

(b) The mark has become distinctive of applicant's goods as evidenced by the showing submitted separately.

(5) Insert the manner or method of using the mark with the goods, i.e., "the goods," "the containers for the goods," "displays associated with the goods," "tags or labels affixed to the goods," or other method which may be in use.

(6) The required fee of $35.00 for each class must be submitted.

(7) If the applicant is not domiciled in the United States, a domestic representative must be designated. See form 4.4.

2. By revising Section 4.1a to read as follows:

Section 4.1a Trademark application by an individual; Principal Register with declaration.

Mark _____

(Identify the mark)

Class No. _____

(If known)

TO THE COMMISSIONER OF PATENTS AND TRADEMARKS:

_____

(Name of applicant, and business trade name, if any)

_____

(Business address)

_____

(Residence address)

_____

(Citizenship of applicant)

The above identified applicant has adopted and is using the trademark shown in the accompanying drawing (1) for the following goods:

_____,

and requests that said mark be registered in the United States Patent and Trademark Office on the Principal Register established by the Act of July 5, 1946.

The trademark was first used on the goods (2) on ———— (Date) was first used in ———— (Type of commerce) commerce (3) on ———— (Date) and is now in use in such commerce.

(4)

The mark is used by applying it to (5) ———— and five specimens showing the mark as actually used are presented herewith.

(6)

_____,

(Name of applicant)

being hereby warned that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any registration resulting therefrom, declares: That he/she believes himself/herself to be the owner of the trademark sought to be registered; that to the best of his/her knowledge and belief no other person, firm, corporation or association has the right to use said mark in commerce, either in the identical form or in such near resemblance thereto as may be likely, when applied to the goods of such other person, to cause confusion, or to cause mistake, or to deceive; that the facts set forth in this application are true; and that all statements made of his/her own knowledge are true and all statements made on information and belief are believed to be true.

_____

(Signature of applicant)

_____

(Date)

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1.)

NOTES

For Notes referred to in this form but not set out here, see same numbered Notes under form 4.1.

3. By revising Section 4.2 to read as follows:

Section 4.2 Power of attorney at law (which may accompany application).*

Applicant hereby appoints (8) ————, ———— (Address) an attorney at law or attorneys at law, to prosecute this application to register, to transact all business in the Patent and Trademark Office in connection therewith, and to receive the certificate of registration.

NOTE.—(8) An individual attorney at law or individual attorneys at law must be named here. If the name of a law firm is given, it will be regarded merely as a designation of address for correspondence.

*An attorney at law is not required to file a power of attorney; an attorney at law may represent a trademark applicant on the basis of being an attorney at law without presenting a power of attorney.

4. By revising Section 4.5 to read as follows:

Section 4.5 Trademark application by a partnership; Principal Register.

Mark ————————————
(Identify the mark)
Class No. ————————————
(If known)

TO THE COMMISSIONER OF PATENTS AND TRADEMARKS:

————————————
(Name of partnership)

————————————
(Names of partners)

————————————
(Business address of partnership)

————————————
(Citizenship of partners)

(Body of application is same as in form 4.1.)

State of ————
County of ———— } ss.

————————————

(Name of partner) states that he/she is a partner of applicant partnership; he/she believes said partnership to be the owner of the trademark sought to be registered; to the best of his/her knowledge and belief no other person, firm, corporation or association has the right to use said mark in commerce, either in the identical form or in such near resemblance thereto as to be likely, when applied to the goods of such other person, to cause confusion, or to cause mistake, or to deceive; and the facts set forth in this application are true.

————————————
(Signature of partner)

JURAT:

Subscribed and sworn to before me, this —— day of ————, ——.

————————————*
Notary Public

*The person who signs the jurat must be authorized to administer oaths by the law of the jurisdiction where executed, and the seal or stamp of the notary, or other evidence of authority in the jurisdiction of execution, must be affixed.

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1.)

5. By revising Section 4.6 to read as follows:

Section 4.6 Trademark application by a corporation; Principal Register.

Mark ————————————
(Identify the mark)
Class No. ————————————
(If known)

TO THE COMMISSIONER OF PATENTS AND TRADEMARKS:

————————————
(Corporate name and State or country of incorporation) (10)

————————————
(Business address)

(Body of application is same as in form 4.1.)

State of ————
County of ———— } ss.

————————————

(Name of officer of corporation) states that he/she is ———— (Official title) of applicant corporation and is authorized to execute this instrument on behalf of said corporation; he/she believes said corporation to be the owner of the trademark sought to be registered; to the best of his/her knowledge and belief no other person, firm, corporation or association has the right to use said mark in commerce, either in the identical form or in such near resemblance thereto as to be likely, when applied to the goods of such other person, to cause confusion, or to cause mistake, or to deceive; and the facts set forth in this application are true.

————————————
(Name of corporation)
By ————————————
(Signature of officer of corporation, and official title of officer)

JURAT:

Subscribed and sworn to before me, this —— day of ————, ——.

————————————*
Notary Public

*The person who signs the jurat must be authorized to administer oaths by the law of the jurisdiction where executed, and the seal or stamp of the notary, or other evidence of authority in the jurisdiction of execution, must be affixed.

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1.)

NOTE.—(10) If applicant is an association or other collective group, the word "association" or other appropriate designation should be substituted for "corporation" when referring to applicant.

6. By revising Section 4.7 to read as follows:

Section 4.7 Service mark application; Principal Register.

Mark ———————————————
(Identify the mark)
Class No. ———————————————
(If known)

TO THE COMMISSIONER OF PATENTS AND TRADEMARKS:

(Insert appropriate identification of applicant in accordance with form 4.1, 4.5, or 4.6.)

The above identified applicant has adopted and is using the service mark shown in the accompanying drawing (11) for the following services: ————————, and requests that said mark be registered in the United States Patent and Trademark Office on the Principal Register established by the act of July 5, 1946.

The service mark was first used in connection with the services (2) on ———————— (Date); was first used in connection with the services rendered in (3) ———————— (Type of commerce) commerce on ———————— (Date); and is now in use in such commerce. (4)

The mark is used by ————————————————

———————————————
(State method of using the mark in connection with the services)

and five (12) ———————— showing the mark as actually used are presented herewith.

(Insert appropriate verification of declaration from form 4.1, 4.1a, 4.5 or 4.6, changing the word "trademark" to "service mark" and the word "goods" to "services.")

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1.)

NOTES

For Notes referred to in this from but not set out here, see same numbered Notes under form 4.1.

(11) See Note (1) under form 4.1, and if drawing is not practicable, insert description of the mark instead of reference to the drawing.

(12) Insert "specimens," or state the nature of the representation of the mark which is furnished.

7. By revising Section 4.8 to read as follows:

Section 4.8 Collective mark application (including collective membership mark); Principal Register.

Mark ———————————————
(Identify the mark)
Class No. ———————————————
(If known)

TO THE COMMISSIONER OF PATENTS AND TRADEMARKS:

(Insert identification of applicant in accordance with form 4.6.)

The above identified applicant has adopted and is exercising legitimate control over the use of the collective mark shown in the accompanying drawing (1) for (13) ———————— (Name the goods or services) to indicate (14) ————————, and requests that said mark be registered in the United States Patent and Trademark Office on the Principal Register established by the act of July 5, 1946.

The collective mark was first used on the (2) ———————— (Insert "goods" or "services") (15) by members of applicant on ———————— (Date); was first used by said members in (3) ———————— (Type of commerce) commerce on ———————— (Date); and is now in use in such commerce. (4)

The mark is used by applying it to (16) ———————— and five specimens of the mark as actually used are presented herewith.

(Insert verification from form 4.6 or declaration from form 4.1a, changing the wording as necessary to agree with applicant's legal entity.)

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1.)

NOTES

For notes referred to in this form but not set out here, see same numbered Notes under form 4.1.

(13) If the application is for a membership mark, omit the word "for" and the space for the name of the goods or services.

(14) If the application is for a membership mark, insert "membership in applicant organization," or similar appropriate statement. If not for a membership mark, omit the words "to indicate" and the following space.

(15) If the application is for a membership mark, the phrase "on the goods or services" should be omitted.

(16) For goods, see Note (5); for services, see form 4.7; for membership, insert the manner or method of using the mark to indicate membership, such as membership cards, wall plaques, or other method which may be in use.

8. By revising Section 4.9 to read as follows:

Section 4.9 Certification mark application; Principal Register.

Mark ———————————————
(Identify the mark)
Class No. ———————————————
(A, for Goods; B, for Services)

TO THE COMMISSIONER OF PATENTS AND TRADEMARKS:

(Insert appropriate identification of applicant in accordance with form 4.1, 4.5 or 4.6.)

The above identified applicant has adopted and is exercising legitimate control over the use of the certification mark shown in the accompanying drawing (1) for the following goods or services:

———————————————,

and requests that said mark be registered in the United States Patent and Trademark Office on the Principal Register established by the act of July 5, 1946.

The certification mark, as used by persons authorized by applicant, certifies (17) ————————; said mark was first used under the authority of applicant on ———————— (Date); was first used in (3) ———————— (Type of commerce) commerce on ———————— (Date); and is now in use in such commerce. (4)

The mark is used by applying it to (5) (or see form 4.7) ————, and five specimens

showing the mark as actually used are presented herewith.

Applicant is not engaged in the production or marketing of any goods or services to which the mark is applied.

(Insert appropriate verification or declaration from form 4.1, 4.1a, 4.5 or 4.6 and add after the word "association" the words "other than those authorized by applicant.")

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1.)

NOTES

For Notes referred to in this form but not set out here, see same numbered Notes under form 4.1.

(17) Insert an appropriate statement as to what the mark certifies, relating to regional origin, or to material, mode of manufacture, quality, accuracy or other characteristic of the goods or services, or that the work or labor on the goods or in rendering the services was performed by members of applicant.

9. By revising Section 4.10 to read as follows:

Section 4.10 Application based on concurrent use; Principal Register.

Mark ————————————————
(Identify the mark)
Class No. ————————————————
(If known)

TO THE COMMISSIONER OF PATENTS AND TRADEMARKS:

(Insert appropriate identification of applicant in accordance with form 4.1, 4.5 or 4.6.)

Use body of form 4.1, 4.7 or 4.8, and add at the end of the first paragraph: "for the area comprising ———— (List the States for which registration is sought)"; and add as final paragraph of application:

The following exception(s) to applicant's right to exclusive use are:

By ————, doing business at ————, who is using the mark ———— (Identify the mark and Reg. No. or Ser. No., if any) for the following goods (or services): ———— in the States of ———— by applying the mark to (16) ———— from ———— (Earliest known date of such use) to the present.

(Insert appropriate verification of declaration from form 4.1, 4.1a, 4.5 or 4.6 and add after the word "association" the words "other than specified in the application.")

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1.)

NOTES

For Notes referred to in this form but not set out here, see same numbered Notes under forms 4.1 and 4.8.

10. By revising Section 4.11 to read as follows:

Section 4.11 Application to register on Supplemental Register.

Mark ————————————————
(Identify the mark)
Class No. ————————————————
(If known)

TO THE COMMISSIONER OF PATENTS AND TRADEMARKS:

(Insert appropriate identification of applicant in accordance with form 4.1, 4.5 or 4.6.)

For the body of an application for a trademark registration (18), use form 4.1, 4.5 or 4.6, whichever is appropriate, changing the word "Principal" to "Supplemental," and adding a final paragraph to the application as follows:

"The mark sought to be registered has been in lawful use in ———— (Type of commerce) commerce in connection with the goods for the year preceding the date of filing of this application." (19)

(Insert appropriate verification or declaration from form 4.1, 4.1a, 4.5 or 4.6.)

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1.)

NOTES

(18) For the body of service mark, collective mark or certification mark applications on the Supplemental Register, use form 4.7, 4.8 or 4.9, whichever is applicable, with the change and addition indicated in this form.

(19) If the mark has not been in use for the year next preceding the filing date, and registration in the United States is required as a basis for obtaining foreign protection of the mark, substitute the following statement for the last sentence: The mark sought to be registered is now in use in ———— (Type of commerce) commerce and domestic registration is required as a basis for foreign protection of the mark.

In this instance applicant will be required to make a showing that U.S. registration is required as a basis for foreign protection of the mark.

11. By revising Section 4.13 to read as follows:

Section 4.13 Application for renewal.

Mark ————————————————
(Identify the mark)
Reg. No. ————————————————
Class No. ————————————————

TO THE COMMISSIONER OF PATENTS AND TRADEMARKS:

(Insert appropriate identification of applicant for renewal in accordance with form 4.1, 4.5 or 4.6.)(1)

The above identified applicant for renewal requests that the above identified registration, granted to ———— (Name of original registrant) on ———— (Date of Issuance); which applicant for renewal now owns, as shown by records in the Patent and Trademark Office, be renewed in accordance with the provisions of section 9 of the act of July 5, 1946.

The mark shown in said registration is still in use in (2) ———— (Type of commerce) commerce on each of the following goods (3) recited in the registration: ———— (List the goods or services or insert the words "all the goods" or "all the services"), the attached specimen (or facsimile) showing the mark as currently used. (4)

(5)

State of ————
County of ———— } ss.

————————————————
(Name of renewal applicant or of person authorized to sign for a juristic renewal appli-

cant) states that to the best of his/her knowledge and belief the facts set forth in this application are true.

(Signature of renewal applicant; if renewal applicant is a corporation or other juristic organization, give the official title of the person who signs for renewal applicant)

(JURAT) (Use jurat from form 4.1.)

REPRESENTATION

(See form 4.2 and Note (6) below.)

NOTES

(1) Applicant for renewal must be the present owner of the registration.

(2) Type of commerce should be specified as "interstate," "foreign," "territorial," or other type of commerce which may lawfully be regulated by Congress. Foreign registrants must specify commerce which Congress may regulate, using wording such as commerce with the United States or commerce between the United States and a foreign country.

(3) If a service mark registration, state "in connection with each of the following services * * *".

(4) If the mark is not in use in commerce at the time of filing the application for renewal, but there is no intention to abandon the mark, facts must be recited to show that the nonuse is due to special circumstances. A specimen (or facsimile) illustrating use, or facts as to nonuse, must be submitted for each class sought to be renewed.

(5) The required fee for renewal sought prior to expiration is $25.00 for each class; and for delayed renewal filed within three months after expiration, an additional $5.00 for each class. If renewal is sought for less than the total number of classes in the registration, the classes for which renewal is sought should be specified.

(6) If applicant for renewal is not domiciled in the United States, a domestic representative must be designated. See form 4.4. If a designation is not submitted with this form, a prior unrevoked designation will meet the requirement if such is already in the registration file.

12. By revising Section 4.14 to read as follows:

Section 4.14 Affidavit for publication under section 12(c).

Mark ———————————
(Identify the mark)
Reg. No. ———————————
Date of Issue ———————————
To: ———————————
(Name of original registrant)

State of ———————— }
County of ———————— } ss.

(Name of registrant or of person authorized to sign for a juristic registrant) states that (1) ———————— (Name of registrant) owns the above identified registration, as shown by records in the Patent and Trademark Office; that said registration is now in force; that the mark shown therein is in use in (2) ———— (Type of commerce) commerce on each of the following goods stated in the registration:

———————— (List the goods or insert the words "all the goods"), and that the benefits of the act of July 5, 1946, are hereby claimed for said registration.

(3)

(Signature; if a corporation or other juristic organization, give the official title of the person who signs.)

(JURAT) (Use jurat from form 4.1.)

REPRESENTATION

(See form 4.2 and Note (4) below.)

NOTES

(1) The present owner of the registration must file the affidavit as registrant.

(2) Type of commerce should be specified as "interstate," "territorial," "foreign," or other type of commerce which may lawfully be regulated by Congress. Foreign registrants must specify commerce which Congress may regulate, using wording such as commerce with the United States or commerce between the United States and a foreign country.

(3) The required fee of $10.00 must be submitted.

(4) If registrant is not domiciled in the United States, a domestic representative must be designated. See form 4.4. If a designation is not submitted with this form, a prior unrevoked designation will meet the requirement if such is already in the registration file.

13. By revising Section 4.15 to read as follows:

Section 4.15 Affidavit required by section 8.

Mark ———————————
(Identify the mark)
Reg. No. ———————————
Class No. ———————————

State of ———————— }
County of ———————— } ss.

(Name of registrant or of person authorized to sign for a juristic registrant) states that (1) ———————— (Name of registrant) owns the above identified registration issued ———————— (Date) (2), as shown by records in the Patent and Trademark Office; and that the mark shown therein is still in use (3) as evidenced by (4) ————.

(5)

(Signature; if a corporation or other juristic organization, give the official title of the person who signs.)

(JURAT) (Use jurat from form 4.1.)

REPRESENTATION

(See form 4.2 and Note (6) below.)

NOTES

The affidavit of which this form is an illustration must be filed within the sixth

year after the date of registration under the act of 1946 or after the date of publication under section 12(c) of said act.

(1) The present owner of the registration must file the affidavit as registrant.

(2) If the registration issued under a prior act and has been published under section 12(c), add: "and published under section 12(c) on ———— (Date)".

(3) If the mark is not in use at the time of filing the affidavit, but there is no intention to abandon the mark, facts must be recited to show that the nonuse is due to special circumstances.

(4) Insert "the specimen included showing the mark as currently used," or recite facts as to sales or advertising which will show that the mark is in current use. Specimen illustrating use, or facts as to use or nonuse, are required for each class for which action is sought.

(5) The required fee of $10.00 must be submitted for each class for which action is sought, and if action is sought for less than the total number of classes in the registration, the classes for which action is sought should be specified.

(6) If registrant is not domiciled in the United States, a domestic representative must be designated. See form 4.4. If a designation is not submitted with this form, a prior unrevoked designation will meet the requirement if such is already in the registration file.

14. By revising Section 4.16 to read as follows:

Section 4.16 Affidavit under section 15.

Mark ————————————

(Identify the mark)

Reg. No. ————————————

Class No. ————————————

State of ————————}
County of ————————} ss.

————————————

(Name of registrant or of person authorized to sign for a juristic registrant) states that (1) ———— (Name of registrant) owns the above identified registration issued ———— (Date) (2), as shown by records in the Patent and Trademark Office; that the mark shown therein has been in continuous use in (3) ———— (Type of commerce) commerce for five consecutive years from (4) ———— (Date) to the present, on each of the following goods (5) stated in the registration:

————————————

(List the goods or services or insert the words "all the goods" or "all the services"); that such mark is still in use in (3) ———— (Type of commerce) commerce; that there has been no final decision adverse to registrant's claim of ownership of such mark for such goods or services, or to registrant's right to register the same or to keep the same on the register, and that there is no proceeding involving said rights pending and not disposed of either in the Patent and Trademark Office or in the courts.

————————————

(Signature; if a corporation or other juristic organization, give the official title of the person who signs.)

(JURAT) (Use jurat from form 4.1.)

REPRESENTATION

(See form 4.2.)

NOTES

(1) The present owner of the registration must file the affidavit as registrant.

(2) If the registration issued under a prior act and has been published under section 12(c), add: "and published under section 12(c) on ————(Date)."

(3) Type of commerce must be specified as "interstate," "territorial," "foreign," or such other commerce as may lawfully be regulated by Congress. Foreign registrants must specify commerce which Congress may regulate, using wording such as commerce with the United States or commerce between the United States and a foreign country.

(4) The date should be the beginning of a five year period of continuous use, all of which five year period falls after the date of registration under the act of 1946 or after the date of publication under section 12(c). A date which would produce a period of continuous use which is longer than five years may be stated provided the period indicated includes five years of continuous use after registration under the act of 1946 or publication under section 12(c)

(5) If a service mark registration, state: "in connection with each of the following services."

15. By adding a new Section 4.16 (Combined 8 & 15) to read as follows:

Section 4.16 (Combined 8 & 15) Combined affidavit under Sections 8 and 15.

Mark ————————————

(Identify the mark)

Reg. No. ————————————

Class No. ————————————

State of ————————}
County of ————————} ss.

————————————

(Name of registrant or of person authorized to sign for a juristic registrant) states that (1) ———— (Name of registrant) owns the above identified registration issued ———— (Date) (2), as shown by records in the Patent and Trademark Office; that the mark shown therein has been in continuous use in (3) ———— (Type of commerce) commerce for five consecutive years from the date of the registration or the date of publication under section 12(c) (4) to the present, on each of the following goods (5) stated in the registration:

————————————

(List the goods or services or insert the words "all the goods" or "all the services"); that such mark is still in use in (3) ———— (Type of commerce) commerce; that such mark is still in use as evidenced by (6) ———— ; that there has been no final decision adverse to registrant's claim of ownership of such mark for such goods or services, or to registrant's right to register the same or to keep the same on the register, and that there is no proceeding involving said rights pending and not disposed of either in the Patent and Trademark Office or in the courts.

(7)

————————————

(Signature; if a corporation or other juristic organization, give the official title of the person who signs.)

(JURAT) (Use jurat from form 4.1.)

REPRESENTATION

(See form 4.2 and note (8) below.)

NOTES

This combined form should not be used with the section 8 portion of the affidavit is based on nonuse.

(1) The present owner of the registration must file the affidavit as registrant.

(2) If the registration issued under a prior act and has been published under section 12(c), add: "and published under section 12(c) on ———— (Date)."

(3) Type of commerce must be specified as "interstate," "territorial," "foreign," or such other commerce as may lawfully be regulated by Congress. Foreign registrants must specify commerce which Congress may regulate, using wording such as commerce with the United States or commerce between the United States and a foreign country.

(4) This form is only appropriate when the five year period of continuous use which is required for section 15 is also the first five years after registration or after publication under section 12(c) which is required for section 8.

(5) If a service mark registration, state: "in connection with each of the following services."

(6) Insert "the specimen included showing the mark as currently used," or recite facts as to sales or advertising which will show that the mark is in current use.

(7) The required fee of $10.00 for section 8 must be submitted for each class for which action is sought, and if action is sought for less than the total number of classes in the registration, the classes for which action is sought should be specified.

(8) If registrant is not domiciled in the United States, a domestic representative must be designated for section 8. See form 4.4. If a designation is not submitted with this form, a prior unrevoked designation will meet the requirement if such is already in the registration file.

16. By revising Section 4.17 to read as follows: Section 4.17 Opposition in the United States Patent and Trademark Office.

In the matter of application Serial No. ————. Published in the Official Gazette on ———— (Date)

———————————

(Name of opposer)

v.

———————————

(Name of applicant)

Opposition No. ———— (To be inserted by Patent and Trademark Office) ———— (Name of opposer), a(n)(1) ———— (Legal entity of opposer), located and doing business at ———— (Address), believes that it/he/she will be damaged by registration of the mark shown in the above identified application, and hereby opposes the same.

As grounds of opposition, it is alleged that:

(Numbered paragraphs should state the grounds and recite facts tending to show why opposer believes opposer will be damaged.)

(2)

State of ————
} ss.
County of ————

———————————

(Name of opposer or of person authorized to sign for a juristic opposer) states that he/she is the opposer named in this opposition, or is the person authorized to sign for the juristic opposer named in this opposition; that he/she has read the opposition and knows the contents thereof; and that the allegations are true, except as to the matters stated therein to be upon information and belief, and as to those matters he/she believes them to be true.

———————————

(Signature of opposer; if opposer is a corporation or other juristic organization, give the official title of the person who signs for opposer.)

(JURAT) (Use jurat from form 4.1)

REPRESENTATION

(See form 4.2 and Note (7) under from 4.1 For opposers who are foreigners, is is customary to regard a power of attorney as the equivalent of a domestic representative.)

NOTES

(1) If an individual, state: "an individual," or "an individual trading as ————," if there is a business trade name. If a partnership, state: "a partnership composed of ———— (Names of partners)." If a corporation, association, or other organization, state "a corporation (or specify other type of organization) organized and existing under the laws of ———— (State or country)."

(2) The required fee of $25.00 must be submitted for each class to be opposed, and if opposition is sought for less than the total number of classes, the classes to be opposed should be specified.

17. By revising Section 4.18 to read as follows:

Section 4.18 Petition to cancel a registration in the United States Patent and Trademark Office.

In the matter of Registration No. ————. Date of Issue ————.

———————————

(Name of petitioner)

v.

———————————

(Name of registrant)

Cancellation No. ———— (To be inserted by Patent and Trademark Office) ———— (Name of petitioner), a(n)(1) ———— (Legal entity of petitioner), located and doing business at ———— (Address), believes that it/he/she is or will be damaged by the above identified registration, and hereby petitions to cancel the same.

As grounds therefor, it is alleged that:

(Numbered paragraphs should state the grounds and recite facts tending to show why petitioner believes that petitioner is or will be damaged.)

(2)

State of ————————}
County of ————————} ss.

————————————————

(Name of petitioner or of person authorized to sign for a juristic petitioner) states that he/she is the petitioner named in this petition to cancel, or is the person authorized to sign for the juristic petitioner named in this petition to cancel; that he/she has read the petition to cancel and knows the contents thereof; and that the allegations are true, except as to the matters stated therein to be upon information and belief, and as to those matters he/she believes them to be true.

————————————————

(Signature of petitioner to cancel; if petitioner is a corporation or other juristic organization, give the official title of the person who signs for petitioner.)

(JURAT) (Use jurat from form 4.1.)

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1. For petitioners who are foreigners, it is customary to regard a power of attorney as the equivalent of a domestic representative.)

NOTES

(1) If an individual, states: "an individual," or "an individual trading as ————." if there is a business trade name. If a partnership, state: "a partnership composed of ———— (Names of partners)." If a corporation, association, or other organization, state "a corporation (or specify other type of organization) organized and existing under the laws of ———— (State or country)."

(2) The required fee of $25.00 must be submitted for each class sought to be cancelled, and if cancellation is sought for less than the total number of classes, the classes sought to be cancelled should be specified.

18. By revising Section 4.21 to read as follows: Section 4.21 Assignment of application.

Whereas ———— (Name of assignor), of ———— (Address), has adopted and is using a mark for which said assignor has filed application in the United States Patent and Trademark Office for registration, Serial No. ————; and

Whereas ———— (Name of assignee), of (1) ———— (Address), is desirous of acquiring said mark;

Now, therefore, for good and valuable consideration, receipt of which is hereby acknowledged, said ———— (Name of Assignor) does hereby assign unto the said ———— (Name of assignee) all right, title and interest in and to the said mark, together with the good will of the business symbolized by the mark, and the above identified application for registration of said mark.

(2)

The Commissioner of Patents and Trademarks is requested to issue the certificate of registration to said assignee.

————————————————

(Signature of assignor; if assignor is a corporation or other juristic organization, give the official title of the person who signs for assignor.)

State of ————————}
County of ————————} ss.

On this —— day of ————, ——, before me appeared ————, the person who signed this instrument, who acknowledged that he/she signed it as a free act on his/her own behalf (or on behalf of the identified corporation or other juristic entity with authority to do so).

————————————————•
Notary Public

•(The wording of the acknowledgement may vary from this illustration but should be wording acceptable under the law of the jurisdiction where executed; the person who signs the acknowledgement must be authorized to do so by the law of the jurisdiction where executed, and the seal or stamp of the notary, or other evidence of authority in the jurisdiction of execution, must be affixed.)

NOTES

(1) If the postal address of the assignee is not given either in the instrument or in an accompanying paper, registration to the assignee may be delayed.

(2) If assignee is not domiciled in the United States, a domestic representative must be designated. See form 4.4, changing the word "applicant" to "assignee."

19. By revising Section 4.22 to read as follows:

Section 4.22 Assignment of registration.

Whereas ———— (Name of assignor), of ———— (Address), has adopted, used and is using a mark which is registered in the United States Patent and Trademark Office, Registration No. ————, dated ————; and

Whereas ———— (Name of assignor), of ———— (Address), is desirous of acquiring said mark and the registration thereof;

Now, therefore, for good and valuable consideration, receipt of which is hereby acknowledged, said ———— (Name of assignor) does hereby assign unto the said ———— (Name of assignee) all right, title and interest in and to the said mark, together with the good will of the business symbolized by the mark, and the above identified registration thereof.

(2)

————————————————

(Signature of assignor; if assignor is a corporation or other juristic organization, give the official title of the person who signs for assignor.)

State of ————————}
County of ————————} ss.

On this —— day of ————, ——, before me appeared ————, the person who signed this instrument, who acknowledged that he/she signed it as a free act on his/her own behalf (or on behalf of the identified corporation or other juristic entity with authority to do so).

————————————————•
Notary Public

*(The wording of the acknowledgement may vary from this illustration but should be wording acceptable under the law of the jurisdiction where executed; the person who signs the acknowledgement must be authorized to do so by the law of the jurisdiction where executed, and the seal or stamp of the notary, or other evidence of authority in the jurisdiction of execution, must be affixed.)

NOTES

(1) If the postal address of the assignee is not given either in the instrument of in an accompanying paper, recording may be delayed pending receipt of such address.

(2) If assignee is not domiciled in the United States, a domestic representative must be designated. See form 4.4, changing the word "applicant" to "assignee."

20. By revising Section 4.23 to read as follows:

Section 4.23 A suggested format for the certificate of mailing under 37 CFR 1.8(a) to be included with the correspondence.

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on ———————— (Date of Deposit).

Print or Type Name of Person Signing Certificate

Signature of Person Signing Certificate

Date of Signature

The Patent and Trademark Office has determined that these rule changes have no potential major economic consequences requiring the preparation of a regulatory analysis under Executive Order 12044.

Dated: September 18, 1978.

DONALD W. BANNER,
Commissioner of Patents and Trademarks.

Approved: November 21, 1978.

JORDAN J. BARUCH,
Assistant Secretary for Science and Technology.

Dated: November 21, 1978.

[FR Doc. 78-33269 Filed 11-27-78; 8:45 am]

(43 FR 55395, Nov. 28, 1978)

Attachment to DOO 30-38

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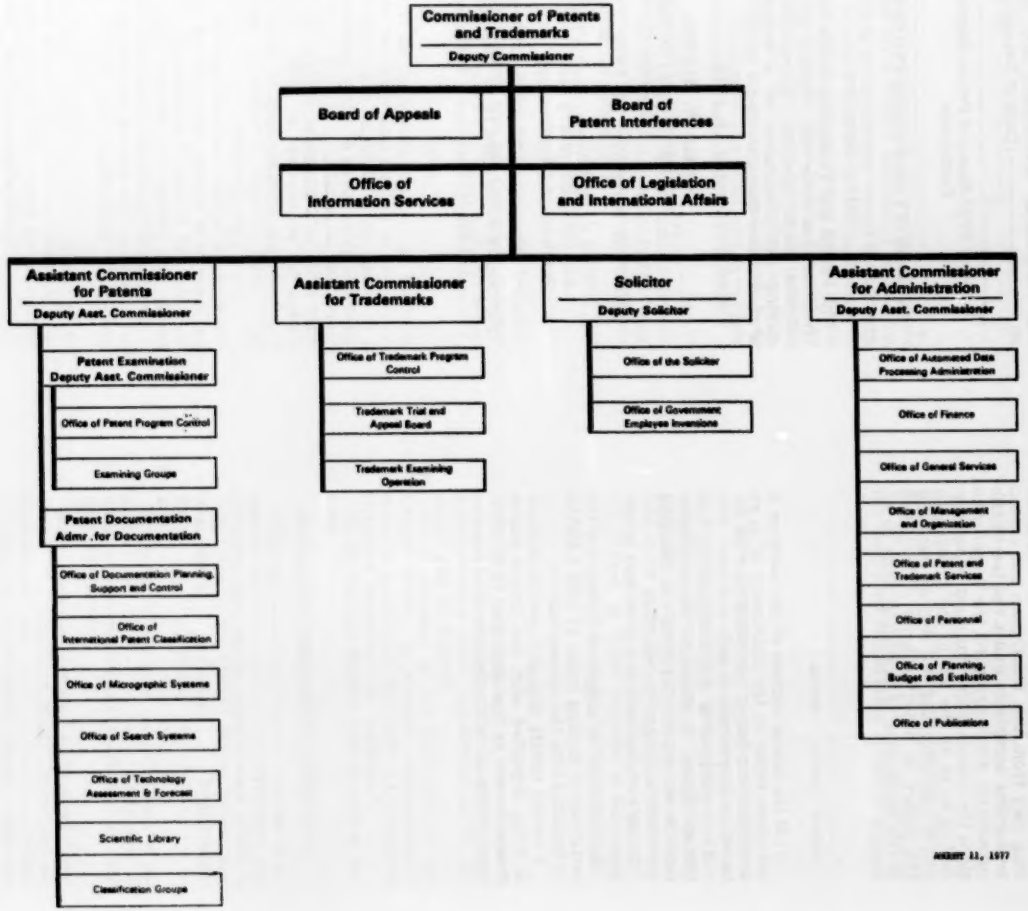
Patent and Trademark Office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Manual of Trademark Examining Procedure
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INDEX OF PATENT NOTICES

A

Items

Abandonments:
- Express — 56
- Notice of — 57

Abstracts — 73

Access to files — 10

Address:
- Change of — 8, 9
- Office Mailing — 1

Affidavits after Final Rejection — 62

Allowance, Reasons for — 65, 66, 74

Amendments:
- Fees — 35
- Hand delivery of — 5
- Preliminary, to cancel claims — 40

Appeals:
- Briefs — 79
- Confidential memoranda — 80
- Hearings — 65, 66, 78

Application, Guidelines for Model — 41

Assignments:
- Accessibility of records — 27
- Certified copies — 34
- Issuance of patent to assignee — 30, 31
- Notification re conflict — 28
- Recording of instruments — 29
- Uniformity in submitting assignee names — 32

C

Certificate of Correction forms — 21

Certificate of Mailing — 12

Certified copies — 34

Claims:
- Copied from patents — 50
- Dependent — 38, 77
- Informal — 40
- Markush-type — 53
- Method — 55
- Multiple Dependent — 46, 47

Commercial success — 76

Computer Program Applications:
- Practice re — 69
- Proposed rules — 68

Copies of applications — 44

Correspondence:
- Change of address — 8, 9
- Identify with Issue Batch No. — 4
- Necessary information on papers — 3, 4
- Post card receipts — 6

Customer Relations Center — 15

D

Dependent Claims — 38, 77

Deposit accounts — 36, 37, 39

Depository Libraries, Patent — 90

Directory, Telephone — 120

Disclosure Document Program — 87

Drawings:
- Acceptable — 17
- Available for reproduction — 16
- Requirements — 46, 47

Duty of Disclosure — 65

E

Energy-related applications — 59

Environmental quality — 58

Express abandonments — 56

Express mail — 11

Extensions of time — 62, 63, 86

F

Items

Fees — 35–40

Foreign language:
- Applications — 43
- Oaths — 65
- References, translations of — 64

Fraud — 51

Function of machine—rejection — 55

G

GPO Subscription service — 22–25

Government Patent Policy:
- Statements under AEC and NASA Acts — 61

Graphical illustrations in specification — 45

Group numbers on papers — 2, 3

H

Hand delivery of papers — 5

Hearings, appeal — 65, 66, 78

Holidays — 14

I

Identifying information on papers — 2–4

Informal applications of foreign applicants — 48

Inquiries, status — 7

Interference Practice — 81–86

Interviews, record of — 60

Inventors' Certificates — 70

L

Looseleaf rule book — 26

M

Mail:
- Delays — 12
- Express — 11

Mailing address, Office — 1

Markush practice — 53

Metric equivalents — 42

Model patent application — 41

Multiple dependent claims — 46, 47

N

Non-English language applications — 43

O

Obviousness — 49, 76

Official Gazette subscriptions — 22–25

Organization chart — 120

P

Patent Cooperation Treaty:
- Administrative Instructions — 94
- Fees — 94, 95
- Filing in Canada — 96
- International application transmittal letter — 95
- Legislation — 92
- Member States — 95
- Questions most frequently asked — 97
- Regulations — 94
- Rule changes — 93

Post card receipt — 6

Postal emergency contingency plan — 89

Powers of attorney:
- Change in plurality of applications — 9
- Substitute — 13

Prior Art:
- Citation of — 54
- Consideration of — 54, 65, 66, 67

Priority:

	Items
Based on application for Industrial Design	71
Based on Foreign application filed under a Bilateral or Multilateral Treaty	72
Based on Inventor's Certificates	70
Protests	65, 66, 67
Public Use Proceedings	65, 66

R

Receipts, post card	6
Recording of instruments	29
Reissues	65, 67
Restriction and Election	52, 53
Rejections:	
Mere function of machine	55
New grounds after appeal brief	75
Rule changes:	
Computer program listings, proposal	68
Drawing requirements	46, 47
Interference practice	85
Miscellaneous examining and appeal	65–67
Multiple dependent claims	46, 47
Patent Cooperation Treaty	93

S

Search Room Procedures:	
Examining Group	19
Public Search Room	18
Violations	20
Searches, Recording of	54
Special treatment of applications:	
Energy-related	59
Environmental quality	58
Status inquiries	7
Subscriptions to Government publications	22–25
Suspension of action	88

T

	Items
Telephone directory	121
Testimony, examiner	91
Title of invention	33
Trademarks:	
Interviews Involving Application	98
Powers of Attorney in Registered Files	99
Public Advisory Committee	100
Request for Extension of Time to Oppose	101
Initial Processing of Applications	102
Petition to Make Applications Special	103
Trademark Registration Treaty	104
Wording in Verification of Application	105
Realignment of Handling of Opposition Papers	106
Conference of Parties in Inter Partes Proceedings	107
International Protection of Government Emblems and Seals	108
Proposal for Distribution of Section 8 and 15 Index Cards to Private Firm	109
Trademark Rules of Practice Book	110
Recording of "Territorial Assignments"	111
Rule 2.165 Requirements for Section 8	112
Dissemination of Trademark Information	113
Notice to Purchasers of Trademark Indices	114
Public Advisory Committee Meeting	115
Trademark Registration Treaty, Implementing Legislation	116
Applications Under Section 44 (Withdrawal of Proposal)	117
Late Filed Fees for Section 8 and Opposition	118
Forms for Trademark Cases	119
Translation of Foreign References	64

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT) : Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of October 3, 1978.

DONALD W. BANNER,
Nov. 7, 1978. *Commissioner of Patents and Trademarks.*

National Inventors Day

The Patent and Trademark Office, along with the National Council of Patent Law Associations, will co-sponsor National Inventors Day in the Public Search Room on Saturday, February 10, from 1:00 p.m. to 5:00 p.m. and Sunday, February 11, 1979 from 10:00 a.m. to 5:00 p.m. The public is invited to view the exhibits on these days and to attend the dedication of the National Inventors Hall of Fame and the induction of four inventors into the Hall of Fame at 1:00 p.m. on Sunday, February 11.

In order to accommodate the exhibits, it will be necessary to close the Public Search Room at 5:00 p.m. on Friday, February 9, 1979.

We would appreciate the cooperation of all users of the Search Room facilities by removing all personal properties and items for the early closing.

LUTRELLE F. PARKER,
For DONALD W. BANNER,
Dec. 7, 1978. *Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,739,170, Re. S.N. 953,264, Filed Oct. 20, 1978, Cl. 250/310, AUGER ELECTRON SPECTROSCOPY, Gerald K. Bohn, et al., Owner of Record: *Physical Electronics Industries, Inc., Edina, Minn.,* Attorney or Agent: Everett J. Schroeder, et al., Ex. Gp.: 256

3,880,313, Re. S.N. 955,708, Filed Oct. 30, 1978, Cl. 215/211, SAFETY CAP AND CONTAINER, Edward G. Akers, Owner of Record: *Inventor,* Attorney or Agent: Peter J. Murphy, Ex. Gp.: 241

3,940,011, Re. S.N. 957,044, Filed Nov. 2, 1978, Cl. 220/66, ALL-PLASTIC DRUM, Robert A. Dubois, et al., Owner of Record: *Grief Bros. Corporation, Delaware, Ohio,* Attorney or Agent: David S. Kane, et al., Ex. Gp.: 241

3,987,252, Re. S.N. 952,067, Filed Oct. 17, 1978, Cl. 179/27 FH, COMPUTER CONTROLLED TELEPHONE ANSWERING SYSTEM, Ronald P. Vicari, et al., Owner of Record: *Graphic Scanning Corp., Englewood, N.J.,* Attorney or Agent: S. C. Yuter, Ex. Gp.: 232

3,989,335, Re. S.N. 954,562, Filed Oct. 25, 1978, Cl. 339/50 R, POWER TAKE-OFF FOR FLUORESCENT LIGHT FIXTURES, Paul Belokin, Jr., Owner of Record: *Inventor,* Attorney or Agent: James E. Nilles, et al., Ex. Gp.: 322

3,990,226, Re. S.N. 959,004, Filed Nov. 9, 1978, Cl. 58/23 D, ELECTROMECHANICAL CLOCK, Wolfgang Fehrenbacher, Owner of Record: *Keininger and Obergfell Fabrik fur Technische Laufwerke and Apparate, St. Georgen, Germany,* Attorney or Agent: Karl F. Ross, Ex. Gp.: 216

3,990,964, Re. S.N. 957,609, Filed Nov. 3, 1978, Cl. 208/216, HYDROTREATING OF PETROLEUM DISTILLATES USING SHAPED CATALYST PARTICLES, William Roy Gustafson, Owner of Record: *American Cyanamid Company, Stamford, Conn.,* Attorney or Agent: Gordon L. Hart, Ex. Gp.: 116

4,002,819, Re. S.N. 957,046, Filed Nov. 1, 1978, Cl. 174/23 C, WATER BLOCKED ELECTRIC CABLES, Leo Victor Woytiuk, Owner of Record: *Northern Telecom Limited, Montreal, Canada,* Attorney or Agent: B. Edward Shlesinger, Jr., Ex. Gp.: 213

4,007,706, Re. S.N. 956,656, Filed Nov. 1, 1978, Cl. 118/50, APPARATUS FOR TREATING WORK PIECES, Karl Ewald Arvidsson, Owner of Record: *Inventor,* Attorney or Agent: Benton S. Duffett Jr., et al., Ex. Gp.: 166

4,008,583, Re. S.N. 953,487, Filed Oct. 23, 1978, Cl. 64/32 R, SWINGABLE SHIELD ASSEMBLY FOR TRACTOR POWER TAKE-OFF, Lewis Kie Davis, Owner of Record: *Deere and Company, Moline, Ill.,* Attorney or Agent: H. Vincent Harsha, et al., Ex. Gp.: 345

4,023,507, Re. S.N. 958,567, Filed Nov. 7, 1978, Cl. 111/6, SOIL CULTIVATING IMPLEMENTS, Cornelis Van der Lely, Owner of Record: *Inventor,* Attorney or Agent: Penrose Lucas Albright, et al., Ex. Gp.: 337

4,030,601, Re. S.N. 957,200, Filed Nov. 2, 1978, Cl. 206/387, HOLDERS FOR TAPE CASSETTES, Peter Ackeret, Owner of Record: *IDN Inventions and Development of Novelties A.G., Lenzerhude, Switzerland,* Attorney or Agent: H. Dale Palmatier, Ex. Gp.: 241

4,078,324, Re. S.N. 957,148, Filed Nov. 2, 1978, Cl. 40/21 C, DISPOSABLE IDENTIFICATION BAND BLANK, Gerald L. Wiebe, Owner of Record: *Inventor,* Attorney or Agent: Max Dressler, et al., Ex. Gp.: 333

PATENT NOTICES

Certificates of Correction for the Week of Jan. 2, 1979

Re. 29,681	4,088,230	4,096,792	4,100,465
Re. 29,798	4,088,667	4,096,807	4,100,866
3,710,419	4,088,706	4,097,113	4,101,354
3,897,372	4,088,744	4,097,144	4,103,214
3,926,045	4,089,838	4,097,636	4,104,447
4,000,649	4,091,422	4,097,664	4,112,883
4,008,489	4,091,543	4,097,757	4,112,952
4,017,758	4,091,862	4,097,854	4,113,316
4,035,211	4,092,884	4,097,883	4,114,101
4,037,360	4,093,348	4,098,131	4,114,275
4,046,909	4,093,533	4,098,177	4,115,963
4,047,158	4,094,405	4,098,217	4,116,296
4,050,362	4,094,465	4,098,264	4,116,342
4,059,246	4,094,513	4,098,420	4,116,408
4,061,824	4,094,596	4,098,527	4,116,438
4,064,640	4,095,205	4,098,532	4,118,434
4,068,929	4,095,245	4,098,629	4,119,349
4,070,336	4,095,688	4,099,458	4,121,140
4,071,409	4,095,974	4,099,511	4,122,363
4,073,733	4,096,145	4,099,776	4,122,418
4,086,212	4,096,257	4,099,885	4,122,774
4,087,801	4,096,335	4,100,218	

Disclaimers

3,481,540.—*Derek Laurie Maytum*, Fernhurst, England, and *Karl Heinz Eggerstedt*, Wedel, Germany. AGRICULTURAL SPRAYING PROCESS AND DEVICE. Patent dated Dec. 2, 1969. Disclaimer filed Oct. 18, 1978, by the assignee, *Imperial Chemical Industries Limited*.

Hereby enters this disclaimer to all claims of said patent.

3,974,226.—*Erhard Bertele*, Dubendorf, and *Peter Schudel*, Grut, near Wetzikon, Switzerland. PROCESS FOR PREPARATION OF TERPENE FLAVORANTS AND NOVEL INTERMEDIATES THEREFOR. Patent dated Aug. 10, 1976. Disclaimer filed Oct. 19, 1978, by the assignee, *Givaudan Corporation*.

Hereby enters this disclaimer to all claims of said patent.

3,984,629.—*Istvan Gorog*, Princeton, N.J. FLYING SPOT SCANNER UNAFFECTED BY AMBIENT LIGHT. Patent dated Oct. 5, 1976. Disclaimer filed Oct. 19, 1978, by the assignee, *RCA Corporation*.

Hereby enters this disclaimer to claims 1, 3, 4 and 5 of said patent.

4,034,474.—*Robert L. Lee*, Colton, Calif. JAW MOVEMENT SIMULATION. Patent dated July 12, 1977. Disclaimer filed Oct. 12, 1978, by the inventor.

Hereby enters this disclaimer to claims 9, 12 and 13 of said patent.

4,075,533.—*Bozidar Janko*, Portland, Oreg. ELECTRON BEAM FORMING STRUCTURE UTILIZING AN ION TRAP. Patent dated Feb. 21, 1978. Disclaimer filed Nov. 8, 1978, by the assignee, *Textronix, Inc.*

Hereby enters this disclaimer to all claims of said patent.

Disclaimer and Dedication

4,096,389.—*John B. Ashe* and *Gwilyn H. Williams*, Palatine, and *Kenneth L. Sypal*, Glen Ellyn, Ill. APPARATUS FOR MINIMIZING RADIATION EXPOSURE AND IMPROVING RESOLUTION IN RADIATION IMAGING DEVICES. Patent dated June 20, 1978. Disclaimer and dedication filed Nov. 1, 1978, by the assignee, *G. D. Searle & Co.*

Hereby enters this disclaimer and dedicates to the public all claims of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

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	Sunnyvale Patent Library*	(408) 736-0795
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Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
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New York	Albany: New York State Library	(518) 474-5125
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	New York Public Library (The Research Libraries)	(212) 790-6291
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Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
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Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF NOVEMBER 18, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	12-19-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	12-16-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	5-1-78
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	9-29-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	10-19-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	5-16-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordinance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	6-17-77
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	11-22-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	5-1-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	2-17-77
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	1-17-77
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	10-3-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	1-16-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	8-11-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	10-6-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	9-2-77

Expiration of patents: The patents within the range of numbers indicated below expire during November 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,007,169 to 3,001,168, inclusive
Plant Patents..... Numbers 2,101 to 2,107, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED JANUARY 2, 1979

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T978,001
SILVER HALIDE PHOTOGRAPHIC PHOTOSENSITIVE MATERIAL

Masakazu Yoneyama; Yasuo Mukunoki; June Yamaguchi; Kimitaka Kameoka, and Yutaka Oka, all of No. 210, Nakanuma, Minami-ashigara-shi, Kanagawa, Japan

Filed Aug. 11, 1977, Ser. No. 823,790
Claims priority, application Japan, Aug. 11, 1976, 51-96343
Int. Cl.[2] G03C *1/38*
U.S. Cl. 96—114.5
No Drawing. 27 Pages Specification

A silver halide photographic photosensitive material in which at least one of the hydrophilic colloid layers thereof contains an organic sulfonic acid composition comprising at least one of the compounds represented by the general formula (I)

$$A - SO_3M \quad (I)$$

wherein A represents a monovalent residue of an unsaturated hydrocarbon having one double bond and containing 8 to 18 carbon atoms, and M represents a hydrogen atom, an alkali metal atom, an alkaline earth metal atom, an ammonium group or an alkylammonium group; and at least one of compounds represented by the general formula (II)

$$B-\underset{\underset{OH}{|}}{CH}-(CH_2)_n-SO_3M \quad (II)$$

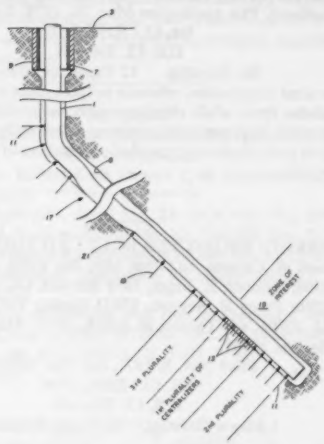
wherein B represents a monovalent residue of a saturated hydrocarbon containing 6 to 16 carbon atoms, n is 1, 2 or 3, and M has the same meaning as M in the above general formula (I)

T978,002
TECHNIQUE FOR CEMENTING CASING IN DEVIATED BOREHOLES

Joseph U. Messenger, 2906 Gladiolus La., Dallas, Tex. 75233

Filed Nov. 10, 1977, Ser. No. 850,125
Int. Cl.[2] E21B *33/13*
U.S. Cl. 166—311
1 Sheets Drawing. 15 Pages Specification

This specification discloses a well completion method for deviated boreholes and in particular a schedule for placing wipers and centralizers along a casing string to be cemented in a deviated borehole to facilitate the reciprocation and cementing thereof in the borehole. A plurality of wipers spaced a first selected distance one from the other are positioned on a portion of the casing string to be located adjacent a zone of interest in the deviated portion of the borehole. A first plurality of centralizers are also positioned on the casing string on the portion to be located adjacent the zone of interest and a second plurality and a third plurality of centralizers are positioned on the casing string, respectively, below and above the zone of interest. The centralizers of the first, second and third pluralities are all spaced a second selected distance, one from the other. Above the third plurality of centralizers other centralizers are positioned on the casing string and the spacing thereof is increased in such a way as to provide for a gradual slope down of the casing string from the centralized portion of the borehole to the lower side thereof. Thereafter, the casing string is characterized by an absence of centralizers along the portion thereof which rests on the lower side of the deviated portion of the borehole. Centralizers are again located on the



casing string through the transition from the deviated portion of the borehole to a vertical portion thereof.

T978,003
REDUCTION OF ASCORBIC ACID INTERFERENCE IN ASSAYS OF AQUEOUS FLUIDS

Tai-Wing Wu, and Shirley S. Yau, both of Kodak Park Division, Rochester, N.Y. 14650

Filed Feb. 21, 1978, Ser. No. 879,573
Claims priority, application Canada, Jul. 11, 1977, 282481
Int. Cl.[2] C07G *7/02*; G01N *31/14*
U.S. Cl. 195—63
1 Sheets Drawing. 41 Pages Specification

Interference caused by ascorbic acid is eliminated by the presence of ascorbate oxidase in reagent compositions used in enzymatic assay of aqueous fluids such as blood serum for a specific analyte wherein the analyte is oxidized to peroxide and the peroxide reacts with an indicator to produce a detectable product. A preferred reagent composition contains an enzyme capable of catalyzing in the presence of oxygen the oxidation of the analyte to a peroxide, an indicator composition to produce a detectable product and ascorbate oxidase.

T978,004
USE OF CHELATING AGENTS IN THE CONVERSION OF COAL TO LOW-MINERAL CONTENT FUEL

William G. Gibson, Fourth Ave., New Eagle, Pa. 15067

Filed Apr. 24, 1978, Ser. No. 899,623
Int. Cl.[2] C10G *1/00*
U.S. Cl. 208—8
No Drawing. 9 Pages Specification

An improvement in the production of low mineral content fuel by coal liquefaction processes which yield as a primary product a mixture of liquid and solids a part of which are suspended in the liquid whereby the separation of the suspended solids is facilitated by the addition of an effective amount of a suitable chelating agent to the mixture. The chelating agent is option-

ally added as a solution of the chelating agent in a suitable solvent and desirably is present in an amount from about 100 to about 150% of the stoichiometric amount required to react with the suspended solids in the mixture.

T978,005

PROCESS FOR EXTRUDING POLYETHYLENE

Dennis L. Funck, Wilmington, Del., assignor to Alcan Aluminum Corporation, Cleveland, Ohio

Continuation of Ser. No. 697,628, Jun. 18, 1976, abandoned, which is a continuation of Ser. No. 250,344, May 4, 1972, abandoned. This application Mar. 28, 1978, Ser. No. 891,063

Int. Cl.[2] B29F *3/08*

U.S. Cl. 264—85

No Drawing. 12 Pages Specification

A process is provided wherein polyethylene is melt-extruded in tubular form while simultaneously maintaining an environment of an inert gas such as nitrogen internally of the tubular form of polyethylene to preclude formation of a layer of large spherulites.

T978,006

SPRING PROJECTED BOLT LATCHING DEVICE

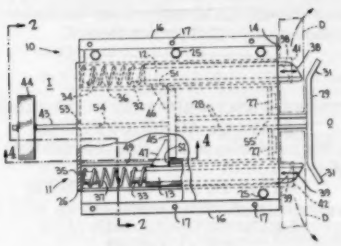
Richard W. Carman, 502 Four Mile Rd. #204, Alexandria, Va. 22308; Kenneth E. Riggs, 7508 Berwick Ct., Alexandria, Va. 22310; Percy R. Seward, 12823 Epping Ter., Silver Spring, Md. 20906, and Thomas R. Smith, 15 W. Maple St., Alexandria, Va. 22301

Filed Nov. 8, 1977, Ser. No. 849,714

Int. Cl.[2] E05C *1/06*

U.S. Cl. 292—41

1 Sheets Drawing. 10 Pages Specification



A latching device includes a pair of spring projected latch bolts located within a housing and movable outwardly of one end wall thereof for engagement with detents of a pair of doors to be latched in a closed position. A rod extending at one end thereof outwardly of an opposite wall of the housing has a handle at such one end and a transverse bar at an opposite end which engages a pair of lugs provided on the bolts, so that the doors may be unlatched as the handle is pulled from inside the housing so as to move the bar toward the opposite end wall of the housing thereby effecting bolt retraction. A notch is provided on the rod for engagement with a portion of the opposite end wall of the housing for maintaining the bolts in an unlatched position, and bolt guides are provided in the housing in the form of passageways of rectangular cross-section for preventing the bolts, having flat outer surfaces lying parallel to the walls of the passageways, from rotating about their central axes. Also, the bolts may be retracted from outside the housing as an elongated member is inserted through the one end of the housing to move the transverse bar.

T978,007

TRACK LINK- T-SHAPED

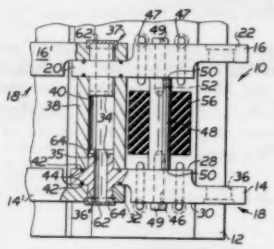
Richard E. Livesay, 1011 W. Deerbrook Dr., Peoria, Ill. 61614

Filed May 8, 1978, Ser. No. 904,086

Int. Cl.[2] B62D *55/20*

U.S. Cl. 305—39

1 Sheets Drawing. 6 Pages Specification



Heavy duty crawler vehicles are supported and controlled by endless track chains located on opposite sides of the vehicle. Such chains consist of a plurality of track shoes attached to pairs of spaced coacting links that are interconnected by hinge pins and bushings. These pins and bushings pressed tightly into alternate but associated link ends require special tooling for initial assembly which tends to create additional problems with track disassembly and service. By using coacting track links with symmetrical inner and outer bosses at one end, sealed and lubricated laterally extending drive bushings and associated links with outwardly coupled bores are readily disassembled and serviced by detaching a central retaining member.

REISSUES

JANUARY 2, 1979

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

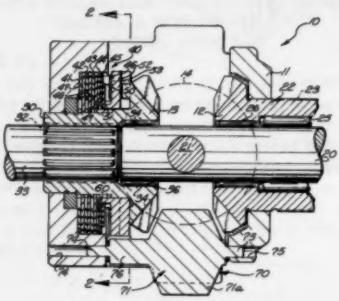
Re. 29,872
DIFFERENTIAL GEAR MECHANISM

Edward J. Goscenski, Jr., Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Original No. 3,811,341, dated May 21, 1974, Ser. No. 304,617, Nov. 8, 1972. Application for reissue May 24, 1976, Ser. No. 689,707

Int. Cl.² F16H *1/44*

U.S. Cl. 74—711 **14 Claims**



1. A differential gear mechanism comprising a differential gear case defining a gear chamber, differential gear means located in said gear chamber, said differential gear means including at least one input gear and a pair of output gears, lockup means for locking up said differential gear means to retard differentiating action, and actuator means for actuating said lockup means, said lockup means including a member rotatable relative to said actuator means upon differentiating action occurring, and said actuator means including an oscillating weight engageable with said member upon rotation thereof relative to said actuator means to retard rotation thereof, and means for moving said member to actuate said lockup means upon a predetermined degree of retardation of rotation of said member.

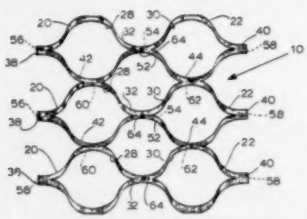
Re. 29,873
SCRAPLESS PLASTIC SHEET MULTI-PACKAGING DEVICE

Ernest R. Cunningham, Libertyville, Ill., assignor to Grip-Pak Systems, Inc., Cape Girardeau, Mo.

Original No. 3,966,044, dated Jun. 29, 1976, Ser. No. 563,885, Mar. 31, 1975. Application for reissue Apr. 25, 1977, Ser. No. 790,450

Int. Cl.² B65D *71/02*

U.S. Cl. 206—150 **7 Claims**



6. A generally scrapless multi-packaging device for a plurality of containers or the like, said multi-packaging device being made from a stretchable and elastic sheet of plastic material and including a plurality of laterally connected pairs of flat sheet material bands arranged in longitudinal rows, adjacent sheet material bands in each said longitudinal row being longitudinally connected to one another, each of the lateral and longitudinal connections being creased along the lateral extent of said connections in opposite alternating directions to one another whereby longitudinal stretching of said sheet causes said sheet material bands to automatically open and assume a generally upstanding condition for assembly to containers.

Re. 29,874
ELECTROPLATING OF THE CUT EDGES OF SHEET METAL PANELS

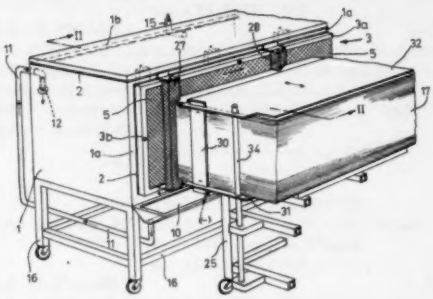
Otto A. Becker, Robert Koch Strasse 9, 66 Saarbruecken, Fed. Rep. of Germany

Original No. 3,907,649, dated Sep. 23, 1975, Ser. No. 397,257, Sep. 14, 1973. Continuation of Ser. No. 204,390, Dec. 2, 1971, abandoned, which is a continuation of Ser. No. 835,116, Jun. 20, 1969, abandoned. Application for reissue Oct. 17, 1977, Ser. No. 843,113

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1968, 1771645; Aug. 1, 1968, 1771933; Oct. 17, 1968, 1803474

Int. Cl.² C25D *5/02, 5/06, 7/06*

U.S. Cl. 204—15 **16 Claims**



1. In a method of electroplating the cut edges of sheet metal panels, the improvement which consists in forming a pile of said panels, inserting one side of said pile through an opening in the wall of an electroplating container, said opening being sealed in a liquid-tight manner around said pile, introducing the electrolyte into said container so as to cause contact of the cut edges of said pile of sheet metal panels with the electrolyte, connecting each panel of said pile with an electroplating current source, performing electroplating of said cut edges, removing the electrolyte from said container, and withdrawing the pile with the electroplated cut edges from the container.

Re. 29,875
BRONCHODILATOR EXPECTORANT ELIXIR

Neil H. Mercer, and Hugh D. Bryan, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Original No. 3,467,754, dated Sep. 16, 1969, Ser. No. 571,425, Aug. 10, 1966. Application for reissue Oct. 31, 1977, Ser. No. 846,873

Int. Cl.² A61K *31/52*

U.S. Cl. 424—253 **3 Claims**

1. A bronchodilator-expectorant composition comprised of a solution containing at least 40% by volume of water and characterized by containing in each 5 milliliters thereof 16.6 to 175

mg. of theophylline, 7.5 to 350 mg. of glyceryl guaiacolate or an equivalent solubilizing weight of potassium guaiacol sulfonate or guaiacol, and from 1/6 to a full therapeutic dose of ephedrine, pseudoephedrine, methoxyphenamine, or protokylol, and from 2 to 35 mg. of cyclopal, aprobarbital, butabarbital, or pentobarbital[.] *wherein the amount of theophylline dissolved in said solution exceeds the saturated solution amount thereof in the solvents employed in said solution, and the theophylline in solution which exceeds said saturated solution amount is solubilized and held in solution by said glyceryl guaiacolate or equivalent solubilizing weight of potassium guaiacol sulfonate or guaiacol.*

Re. 29,876

CONTAINER FOR TRANSPORTING RADIOACTIVE MATERIALS

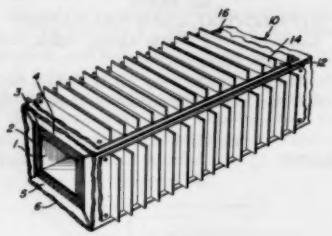
Stanton L. Reese, 726 Laurel La., Lakeland, Fla. 33803

Original No. 3,727,059, dated Apr. 10, 1973, Ser. No. 109,925, Jan. 26, 1971. Application for reissue Jul. 29, 1977, Ser. No. 820,228

Int. Cl.[2] G21F *5/00*

U.S. Cl. 250—506 **13 Claims**

1. A container for transporting radioactive materials which comprises (a) a body having a beta gamma radiation absorbing material disposed between a central cavity for holding [radioactovem] *radioactive* material and an outer wall of [ocrrosion] *corrosion* resistant material, *said outer wall having an essentially smooth exterior surface,* and (b) heat dissipating fins



detachably mounted on and extending outwardly from said outer wall in thermally conductive contact therewith, said heat dissipating fins having a lower density and a higher thermal conductivity than said corrosion resistant material.

PLANT PATENTS

GRANTED JANUARY 2, 1979

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,360
ROSE PLANT

J. Benjamin Williams, 2800 Elnora St., Silver Spring, Md. 20902

Filed Feb. 6, 1978, Ser. No. 875,587
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—7 1 Claim

1. A new and distinct variety of rose plant of the mini-flora (R) class (dwarf-floribunda type) substantially as shown and described, characterized particularly by recurrent very small and well formed flowers borne singly and in sprays of 3 to 5 blooms having a cheerful blending of yellow, pink, peach and ivory with a brilliant orange-red cast on reverse of petals, on a well formed low compact plant, winter hardy and disease resistant, excellent for pot-forcing and use in tubs or planters for outside display.

4,361
ROSE PLANT

J. Benjamin Williams, 2800 Elnora St., Silver Spring, Md. 20902

Filed Feb. 6, 1978, Ser. No. 875,586
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—20 1 Claim

1. A new and distinct variety of rose plant of the grandiflora class, substantially as shown and described, characterized particularly by recurrent flowers borne singly and in sprays of 3 to 5 blooms having fiery orange-red cast at the inner petals with a smokey red marking on tip of bud and outer petals, on a strong upright vased shaped plant of above average winter hardiness with outstanding strong disease resistance.

4,362
NECTARINE TREE

C. Floyd Zaiger, 537 Rosemore Ave., Modesto, Calif. 95351

Filed Dec. 12, 1977, Ser. No. 840,241
Int. Cl.[2] A01H *5/03*
U.S. Cl. Plt.—41 1 Claim

1. A new and distinct variety of nectarine tree, as illustrated and described, which is a regular and productive bearer of large size, clingstone fruit, with firm flesh, attractive red skin color and of good eating quality; and fruit is further characterized in comparison to Gold King Nectarine by having smoother skin, a higher degree of red skin color, more uniform ripening and better shipping and storage quality.

4,363
IMPATIENS PLANT

John J. Ryan, 39877 Sundale Dr., Fremont, Calif. 94538

Filed Feb. 6, 1978, Ser. No. 875,584
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct form of Impatiens plant as described and illustrated, known by the cultivar name Apache, and particularly characterized by a thick, rich, dark foliage; no variegation; a deep red flower that is slightly cupped; and a very upright growth habit.

4,364
IMPATIENS PLANT SHAWNEE

John J. Ryan, 39877 Sundale Dr., Fremont, Calif. 94538

Filed Feb. 3, 1978, Ser. No. 874,930
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct form of Impatiens plant as described and illustrated, known by the cultivar name Shawnee, and particularly characterized by its distinctively wide variegation (dark green outer rim with prominent red veins in an off-gold center); its upright growth habit; good breaking action; fairly compact; and a medium pink flower.

PATENTS

GRANTED JAN. 2, 1979

ERRATA

For CLASS	See PATENT NO.
009-337	4,131,974
405-299	4,132,079
405-261	4,132,080
405-296	4,132,081
405-253	4,132,082
405-184	4,132,083
405-171	4,132,084
102-049.8	4,132,165
281-015 A	4,132,501
422-001	4,132,526
521-027	4,132,682
521-106	4,132,683
526-060	4,132,705
528-089	4,132,706
528-273	4,132,707
546-007	4,132,708
546-089	4,132,709
546-063	4,132,710
546-286	4,132,711
424-005	4,132,731
562-550	4,132,732
562-601	4,132,733
562-522	4,132,734
562-582	4,132,735
340-779	4,132,924
330-283	4,132,963
313-188	4,132,982
350-336	4,132,984

PATENTS

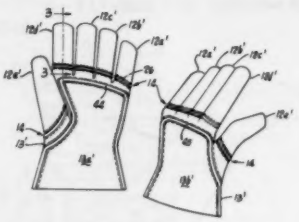
GRANTED JANUARY 2, 1979

GENERAL AND MECHANICAL

4,131,952
SAFETY GLOVE

Frederick K. Brenning, Jr., 310-1/2 Prospect St., Wellington, Ohio 44090

Filed Sep. 14, 1977, Ser. No. 833,088
Int. Cl.[2] A41D *13/00, 13/10*
U.S. Cl. 2—2 R **19 Claims**

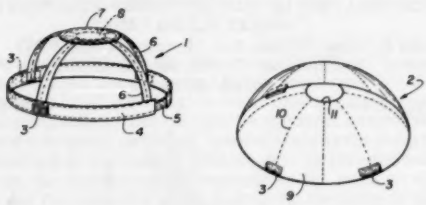


1. A safety garment comprising:
(a) a first portion for covering at least a part of a body,
(b) a second portion for covering an additional part of the body and separable from the first portion, and
(c) means, including strands of substantially lower tensile strength than said portions, in the form of a separate fabric sewn or bonded to said first and second portions, joining said separable portions to permit separation at said means when the portions are pulled in opposite directions across said means.

4,131,953
VENTILATED HEAD GEAR

Kuninori Kimotsuki, Machida, Japan, assignor to Institute for Science of Labour, Kanagawa, Japan

Filed Oct. 4, 1977, Ser. No. 839,185
Claims priority, application Japan, Oct. 8, 1976, 51/135502[U]; Oct. 8, 1976, 51/135503[U]
Int. Cl.[2] A42B *1/20, 1/18*
U.S. Cl. 2—171.1 **10 Claims**

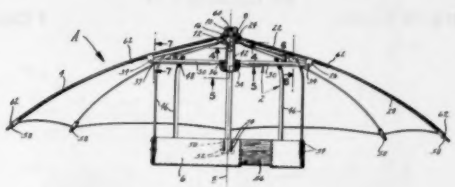


1. Headwear comprising:
(a) a hat band extending in a closed loop about an axis and having an inner face and an outer face;
(b) a plurality of rib members attached to said band in circumferentially spaced relationship,
(1) said rib members extending from said band in a common axial direction and converging toward said axis,
(2) respective portions of said rib members remote from said band and adjacent said axis being fastened to each other;
(c) a shell dimensioned spacedly to envelop said band and said rib members,
(1) said shell having the approximate shape of a cup and including an annular rim portion bounding an open side of said shell and a bottom wall formed with an opening therein;
(d) fastening means on said rim portion for releasably fastening the same to the outer face of said hat band in a position in which said rim portion and said outer face define therebetween a ventilating gap and said opening is axially aligned with said portions of the rib members;
(e) a disc member larger than said opening; and
(f) securing means for releasably securing said disc member to said portions of the rib members.

4,131,954
COLLAPSIBLE HEADGEAR

Louis C. Brock, 13468 Forest Lac, St. Louis County, Mo. 63141, and Richard H. Nielson, 735 Bartolet, St. Louis County, Mo. 63125

Filed Aug. 31, 1977, Ser. No. 829,224
Int. Cl.[2] A42B *1/20;* **A45B** *11/04*
U.S. Cl. 2—177 **15 Claims**



1. A collapsible headgear comprising: a hub; rib and strut assemblies comprising rib members connected at their inner ends with the hub and being capable of folding toward and away from the axis of the hub, a collar along the axis of the hub and being capable of moving toward and away from the hub and struts connected between the collar and the rib members and being capable of folding with respect to both the collar and the rib members, whereby the struts will push the ribs outwardly when the collar is moved toward the hub and will draw the rib members inwardly when the collar is moved away from the hub; supports having at their upper ends apertures and being slidable with respect to the rib and strut assemblies, with the supports extending downwardly from the rib and strut assemblies generally in the direction of the hub axis; a headband connected to the lower ends of the supports; and a cover extended over and attached to the rib members, the cover forming a protective surface above the headband when the collar is moved toward the hub and the rib members are forced outwardly, but being folded in a collapsible condition when the collar is moved away from the hub to its fullest extent.

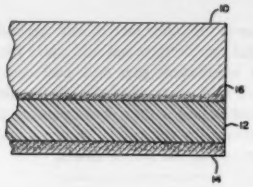
4,131,955
GARMENT EMBLEM

Thomas I. Haigh, Holland, Pa., assignor to The Franklin Institute, Philadelphia, Pa.

Filed Jan. 7, 1977, Ser. No. 757,568
Int. Cl.[2] A41D *27/08*
U.S. Cl. 2—246 **6 Claims**

1. An emblem for garments comprising a laminate adapted especially for use as a removable emblem and which avoids curling during manufacturing of the emblem, consisting of an intermediate and two outsie layers, all laminated together as a three-part laminate, one of the outside layers being a layer about fifteen mils thick of cloth of about 65 percent polyester and 35 percent cotton, the other of the outside layers being a layer about two and a half mils thick of uncreped paper tissue and the intermediate layer being one about eight mils thick of low density polyethylene which has a specific gravity of about 0.916, the polyethylene also penetrating the paper tissue to a

place just short of appearing on the surface and penetrating the cloth approximately correspondingly in distance, as a result of



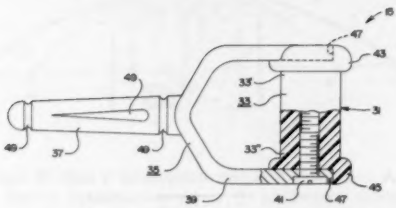
being held at 435° F ± 5° under a platen pressure of 10 ± 1 psi for a time of 10 ± ½ seconds.

4,131,956

ELBOW PROSTHESIS

James T. Treace, Malibu, Calif., assignor to Richards Manufacturing Company, Inc., Memphis, Tenn.

Filed Feb. 14, 1977, Ser. No. 768,605
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.91 **4 Claims**



1. An elbow prosthesis for implanting in a human elbow, said elbow prosthesis comprising: a humeral component means for being fixedly anchored to the distal end of the humerus in a human elbow to replace the articulating surface thereof, said humeral component means including a single head member having a curved face portion for replacing the articulating surface of the distal end of the humerus, said humeral component means including a substantially Y-shaped body member for being fixedly anchored to the distal end of the humerus, said head member of humeral component means including an elongated, substantially cylindrical portion fixedly attached to said body member of said humeral component means for replacing the articulating surface of the distal end of the humerus to articulatingly coact with the articulating surface of the proximal end of the ulna of the human elbow, said cylindrical portions extending across the mouth of said Y-shaped body member of said humeral component means, said head member of said numeral component means including a first flange portion fixedly attached to said first end of said cylindrical portion thereof and including a second flange portion fixedly attached to said second end of said cylindrical portion thereof for restricting lateral movement of said humeral component means when said humeral component means is fixedly anchored to the distal end of the humerus and is articulatingly engaging the articulating surface of the proximal end of the ulna.

4,131,957

BALL AND SOCKET PROSTHETIC JOINT

Jack C. Bokros, Alpine, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed Aug. 12, 1977, Ser. No. 823,916
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.91 **7 Claims**

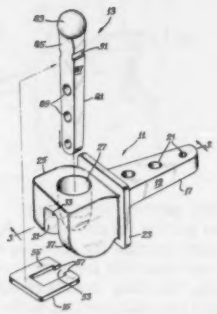
1. A prosthetic joint of the ball-and-socket type which includes a first socket-carrying member and a second ball-carrying member,

both of said members having a stem portion at one end thereof for insertion into the medullary canal of the bone and having the socket or the ball formed at the opposite end thereof,

said socket including a generally cylindrical passageway which extends downward from an upper surface and which terminates in a bottom surface having a generally spherical shape,

said socket containing a slot which intersects said passageway, said slot terminating a substantial distance short of the upper surface of said socket portion,

said stem of said second member being proportioned to fit through said slot,



said ball portion of said second member being proportioned to be received in said passageway and having a curvature which generally matches the curvature of said generally spherical bottom surface, and

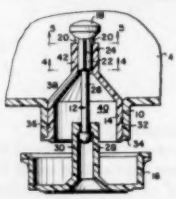
retaining means connected to said second member at a shank portion of said second member which interconnects said ball and said stem, which is spaced from said ball a distance at least equal to the distance between the undersurface of said socket and said generally spherical bottom surface, which retaining means locks said first and second members in hinged relationship to each other with said second member stem portion extending out of said slot.

4,131,958

DISPENSATION OF CONCENTRATED SOLUTION INTO TOILET FLUSH TANK

John E. Dolan, 7 Maple Ave., Haverstraw, N.Y. 10927

Filed May 10, 1976, Ser. No. 684,613
Int. Cl.[2] E03D *9/02*
U.S. Cl. 4—227 **14 Claims**



1. A device for dispensing a concentrated solution into a toilet flush tank comprising

a closed container for said concentrated solution, said container having an outlet opening at a lower portion thereof,

a downwardly-open air-entrapment chamber in said outlet opening for entrapping air as the water level rises in the toilet tank, and

a tube extending upwardly from the upper portion of the air-entrapment chamber,

a plug snugly fitted within the tube,

a groove providing a narrow elongated passage between

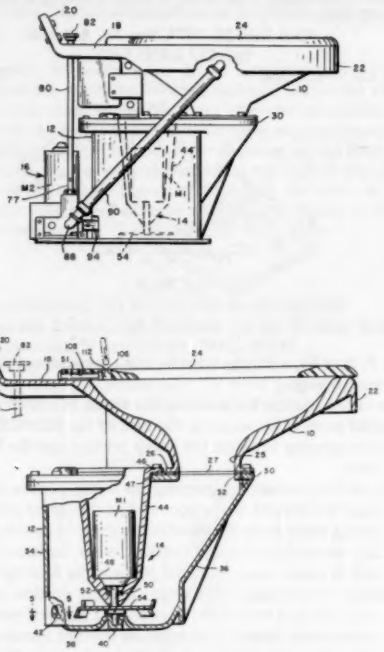
said tube and said plug communicating between an upper portion of the air-entrapment chamber and the interior of said container to prevent water from entering the container as the water level rises.

4,131,959

NON-POLLUTING TOILET SYSTEM

James H. Albertassi, W. Falmouth, Mass., and Walter O. Heinze, Swarthmore, Pa., assignors to International Water Saving Systems, Inc., New York, N.Y.

Filed Jun. 3, 1977, Ser. No. 803,071
Int. Cl.[2] E03D *9/10, 11/11*
U.S. Cl. 4—319 **20 Claims**



1. A toilet system capable of rendering the effluent innocuous and reducing the solid matter therein to microparticle size comprising a bowl, a treating chamber connected to the bowl for receiving effluent from the bowl for treatment, a reversible, motor-driven pump, conductor means connecting the pump to the bowl and to the treating chamber, valve means interposed between the conductor means connecting the pump to the bowl and the conductor means connecting the pump to the treating chamber operable when the pump is rotated in one direction to take water into the system through a port and deliver it to the bowl to flush the latter and when the pump is rotated in the opposite direction to withdraw the effluent from the treating chamber and discharge it through the same port, macerator means in the treating chamber for macerating the effluent when flushed into the treating chamber and means for supplying a bacteriacide to the treating chamber.

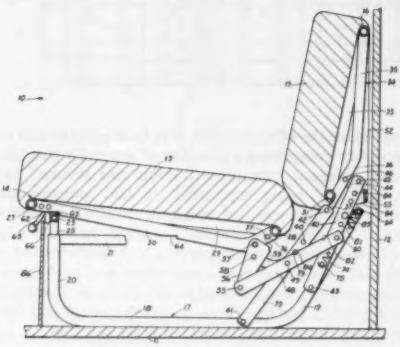
4,131,960

CONVERTIBLE SEAT-BED

Howard M. Quakenbush, Apple River, Ill., assignor to Flexsteel Industries, Inc., Dubuque, Iowa

Filed Aug. 29, 1977, Ser. No. 828,727
Int. Cl.[2] A47C *17/17*
U.S. Cl. 5—37 R **16 Claims**

1. In a convertible seat-bed assembly, a base structure, a seat support structure for support of a generally rectangular seat cushion secured thereto, a back support structure for support of a generally rectangular back cushion secured thereto, and linkage means for supporting said seat and back support structures from said base structure for movement between a seating condition and a bed condition, said seat support structure in said seating condition being in a first position and in said bed condition being in a second position spaced forwardly from said first position, said back support structure in said seating condition being inclined rearwardly and upwardly from a first edge thereof to a second edge thereof with said first edge being spaced rearwardly and upwardly from a rearwardly edge of said seat support structure to provide a first predeterimined horizontal spacing distance therebetween and a first predetermined vertical spacing distance therebetween, said back support structure in said bed condition being generally horizontal with said first and second edges thereof in generally horizontal alignment and with said first edge thereof being spaced rearwardly from said rearward edge of said seat support structure through a second predetermined horizontal spacing distance, said predetermined spacing distances being so related as to



position the rearward edge portion of a seat cushion on said seat support structure an an edge of a back cushion on said back support structure in close proximity in both said seating and bed conditions of said linkage means with said second predetermined horizontal spacing distance being substantially less than said first predetermined horizontal spacing distance, said linkage means including front and rear swing arm means having lower ends pivotally connected to said base structure on spaced horizontal axes, and means supporting both of said seat and back support structures from said front and rear swing arm means, all portions of said linkage means being located in both said seating and bed conditions on the downward and rearward side of a boundary defined by said seat and back support structures and a plane extending from said rearward edge of said seat support structure and said one edge of said back support structure, said linkage means including means providing a pivotal connection between an upper end portion of said front swing arm means and said back support structure adjacent said one edge thereof, said linkage means including first link means pivotally connected to said front and rear swing arm means at intermediate points thereof.

4,131,961

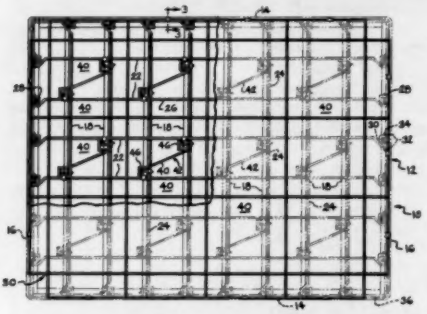
FORMED WIRE BOX SPRING WITH WIRE GRID UNIT

John P. Kitchen, Georgetown, Ky., assignor to Hoover Universal, Inc., Saline, Mich.

Filed Aug. 15, 1977, Ser. No. 824,340
Int. Cl.[2] A47C *23/05*
U.S. Cl. 5—247 **5 Claims**

1. In a box spring assembly which includes a horizontal main frame of generally rectangular shape having longitudinal and transverse dimensions and side and end rails, a plurality of main wire springs mounted on said main frame, each of said main springs having a generally horizontal body portion and de-

pending end portions, said spring end portions being supported on horizontally spaced portions of said rails so that some of said spring body portions extend longitudinally and others transversely of said frame and said body portions are arranged criss-cross fashion in a substantially horizontal plane disposed above said frame thereby forming a mattress support framework in said plane having rectangular spaces formed in the rectangular areas between adjacent pairs of adjacent transverse and longitudinal body portions; the improvement comprising a wire grid unit supported on said mattress support framework



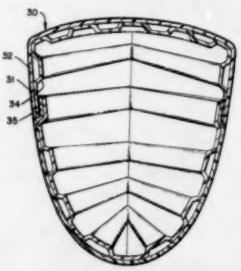
so as to reduce the effective sizes of at least some of said spaces, said grid unit comprising a plurality of generally straight wire members arranged criss-cross fashion and secured to each other, said unit being supported on said mattress support framework so that some of said grid members extend transversely of said frame substantially midway between adjacent pairs of transversely extending spring body portions and others of said grid members extend longitudinally of said frame substantially midway between adjacent pairs of longitudinally extending spring body portions to thereby cut in half the sizes of the spaces between said adjacent body portions.

4,131,962

RIBBED INNER SHELL FOR A HULL OF A CATAMARAN

Eugene G. Vernon, 2622 Crestview Dr., Newport Beach, Calif. 92105

Filed May 9, 1977, Ser. No. 794,723
The portion of the term of this patent subsequent to Jun. 13, 1995, has been disclaimed.
Int. Cl.² B63B *3/00*
U.S. Cl. 9—6 P **2 Claims**



1. A reinforced hull for a catamaran which has a first member which forms the first portion of the hull and which has a sidewall with a band adjacent to its peripheral edge that is indented to form a ledge and a second member which forms the second portion of the hull and which has a sidewall which is bent inwardly a slight amount adjacent to its peripheral edge in order that it may rest on the ledge, each of the sidewalls of said first member and said second member comprising:

a. a first layer of fiberglass and polyester resin which forms the exterior surface of said sidewall for the first member and the second member; and

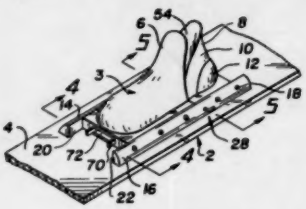
b. a second layer of fiberglass and polyester resin which forms the interior surface of said sidewall, said second layer having a plurality of substantially parallel ribs running longitudinally along said hull with said ribs being formed from said layer and said second layer being chemically joined to said first layer in order to produce a ribbed interior surface for said hull.

4,131,963

SKI BINDING

Knute N. Johnson, 1005 Haslam Ave., Victoria, B.C., Canada (V9B 2N3)

Filed Dec. 30, 1977, Ser. No. 866,110
Int. Cl.² A63C *5/00*
U.S. Cl. 9—310 AA **15 Claims**



1. A boot for a ski, the boot having a toe end and a heel end and comprising:

an instep portion for securing the instep of a skier's foot;

a heel portion for securing the heel of the skier's foot;

a foot opening between the instep portion and the heel portion;

means for pivotally connecting the instep portion to the ski near the toe end of the boot so that the instep portion can swing away from the ski adjacent the foot opening, generally about the toe end of the boot, when the boot is permitted to move away from the ski near the foot opening;

means for pivotally connecting the heel portion to the ski near the heel end of the boot so that the heel portion can swing away from the ski adjacent the foot opening, generally about the heel end of the boot, when the boot is permitted to move away from the ski near the foot opening; and

releasable means permitting the boot to move away from the ski near the foot opening to increase the size of the foot opening so the skier's foot can be inserted easily into the boot and permitting the boot to be flattened against the ski after the foot is inserted so the foot is firmly held within the boot for skiing.

4,131,964

BAR STOCK GUIDES TUBES FOR METAL WORKING MACHINES AND SOUND-DAMPING LINERS FOR SUCH TUBES

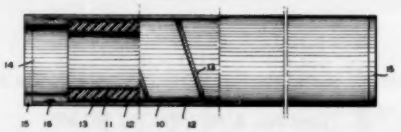
Robert A. Cottingham, York, Pa., assignor to The Polymer Corporation, Reading, Pa.

Continuation of Ser. No. 603,079, Aug. 12, 1975, abandoned, which is a continuation of Ser. No. 398,341, Sep. 28, 1973, abandoned. This application Feb. 11, 1977, Ser. No. 767,985
Int. Cl.² B23B *25/00*; B23G *11/00*
U.S. Cl. 10—162 R **4 Claims**

1. A bar stock feed tube assembly for metal working machines that provides a supporting structure through which lengths of bar stock may be fed, comprising: an elongated outer cylindrical metal tube, a slightly shorter inner cylindrical sound damping and wear liner coaxially disposed within the

tube, and a pair of annular locking rings to secure the liner within the tube;

the liner comprising a tubular extrusion of ultra high molecular weight polyethylene and a ribbon of a foamed resiliently compressible thermoplastic material spirally wrapped around the surface of the liner, the interior diameter of the tube, the outer diameter of the liner, and the thickness of the ribbon being selected to hold the spiral



wrapping in compression along substantially its entire axial extent when the liner is positioned within the tube;

the locking rings having an outer diameter essentially the same as the inside diameter of the tube, an inside diameter slightly greater than the inside diameter of the liner, an enlarged annular shoulder adjacent one end of the rings having an outside diameter essentially the same as the outside diameter of the tube and means to fixedly position each locking ring in opposite ends of the tube.

4,131,965

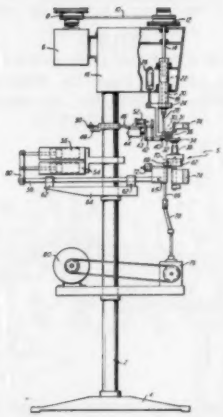
MACHINE TO WORK ON SHOE SOLES

Henry von den Benken, and Elisabeth von den Benken, both of 2212 Centre St., West Roxbury, Mass. 02132

Continuation-in-part of Ser. No. 711,158, Aug. 3, 1976, abandoned. This application Nov. 21, 1977, Ser. No. 853,026

Int. Cl.[2] A43D *7/00, 119/00;* **B25C** *5/00*

U.S. Cl. 12—86.7 **8 Claims**



1. A machine for moving a workpiece past a workpiece treating means comprising: a fixture adapted to support the workpiece; means mounting the fixture for universal movement in a prescribed plane; a pair of track sections, mounted to the fixture for movement towards and away from each other, comprised of facing concave end portions and overlapping finger portions that extend from opposite ends of the concave end portions; a locating plate mounted to each concave portion and extending upwardly to the fixture; adjusting means for concurrently moving the track sections and the locating plates towards and away from each other; a workpiece treating means so located as to treat a part of the workpiece proximate to the workpiece periphery as said workpiece part moves past the workpiece treating means; and drive means; and drive means cooperative with the track sections as to so move the fixture in said prescribed plane as to move successive segments of said workpiece part past the workpiece treating means.

4,131,966

DOMESTIC CLEANING DEVICE

Jacob S. Gross, 541 Wythe Ave., Brooklyn, N.Y. 11211

Filed Nov. 7, 1977, Ser. No. 849,120

Int. Cl.[2] A46B *13/02*

U.S. Cl. 15—28 **1 Claim**

1. A domestic cleaning device for cleaning and polishing pots, pans, kitchen utensils, eating utensils, appliances, surfaces, and the like, said domestic cleaning device comprising

a housing having a hole formed through one end thereof;

an electric motor mounted in the housing and having a shaft extending through the hole thereof;

an ON-OFF switch electrically connected between the motor and a source of electrical energy and extending out of the housing for manual operation thereof;

a plurality of substantially disc-type cleaning and polishing members adapted to be individually removably affixable to the shaft outside the housing for rotation by the motor, said cleaning and polishing members including a steel wool pad, a natural hair pad, a wire bristle member, a silver polisher, a sponge, a shoe brush, and the like;

a flexible cable having spaced opposite first and second ends, the first end having first coupling means for removably affixing it to the shaft and the second end having second coupling means for removably affixing it to a disc-type cleaning and polishing member;

a handle extending from the housing at an end opposite that having the hole formed therethrough for providing a grip for a first hand of a user;

a pistol grip handle pivotally mounted on the housing intermediate the ends thereof for providing a grip for a second hand of a user, said pistol grip handle having a pair of partly cylindrical members pivotally mounted on diametrically opposite ends of an axis through the housing and having a retracted position alongside said housing and an extended position;

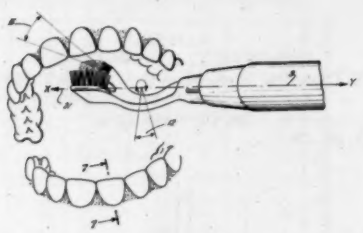
mounting means for releasably supporting said domestic cleaning device in substantially upright position; and

a waterproof housing removably covering said mounting means and said device mounted on it with said cable extending from said mounting means whereby an item spaced from said mounting device is cleanable via said cable and a disc-type cleaning and polishing member removably affixed to said cable.

4,131,967
TOOTHBRUSH

Karl-Heinz Nörthemann, Ringstrasse 18, 3501 Schauenburg 4, and Heinrich Krahn, In den Steinäckern 5, 3507 Baunatal 5, both of Fed. Rep. of Germany

Filed Jul. 1, 1976, Ser. No. 684,184
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1976, 2608532
Int. Cl.[2] A46B 9/04
U.S. Cl. 15—167 A 2 Claims

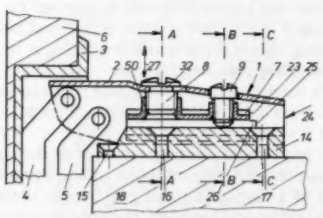


1. A toothbrush comprising an elongated handle having a longitudinal axis, a front end and a rear end, a U-shaped head coaxial with said front end of the handle, said head having two opposite bristles-carrying portions located to opposite sides of said axis and each of said bristles-carrying portions having a front edge inclined at an acute angle to said axis; and a plurality of bristle tufts projecting spaced from each other inwardly from said bristles-carrying portions and being arranged in a first plurality of rows substantially parallel to said front edge and in a second plurality of rows parallel to said axis, said first and second plurality of rows intersecting each other at four corner points and the axes of the tufts of bristles at said four corner points extending inclined toward each other and the ends of said bristles in said second plurality of rows on said opposite bristles-carrying portions being arranged to define an acute gap therebetween, said handle having rearwardly of said head a portion curved transversely to said axis.

4,131,968
REINFORCED HINGE WITH ADJUSTABLE TIGHTENING MEANS

Alfred Grass, Konsumstrasse 20, Hoechst, Austria (A-6973)

Filed Oct. 21, 1977, Ser. No. 844,217
Int. Cl.[2] E05D 7/04
U.S. Cl. 16—129 5 Claims



1. An adjustable hinge arrangement between a stationary member and a movable closure member, said hinge arrangement comprising a stationary base plate and an adjustable sliding member carried by the base plate, an adjustable hinge arm for attachment to the sliding member, and pivot means joining the hinge arm to the closure member, the adjustable sliding member being capable of adjustment in a direction that is substantially perpendicular to the movable closure member, the adjustable hinge arm being capable of adjustment in a direction that is substantially parallel to the plane of the movable closure member, there being a tongue and groove connection between the base plate and the sliding member, and locking means between the sliding member and the base plate, the adjustable hinge arm having a transverse cross-section of inverted U-shape that encompasses the sliding member, the side walls of the hinge arm including cut-outs for loosely receiving the side portions of the sliding member therein so the load on the hinge arm is not carried by the said side walls to the sliding member, but by the said side walls to the base plate.

4,131,969
SECURITY STUD FOR HINGES

Charles R. Suska, Roxbury, Conn., assignor to The Stanley Works, New Britain, Conn.

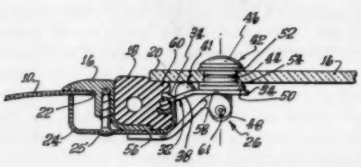
Filed Jun. 2, 1977, Ser. No. 802,365
Int. Cl.[2] E05D 11/00
U.S. Cl. 16—137 17 Claims

1. A hinge comprising a pair of adjacent hinge leaves, a plurality of axially aligned hinge knuckles, at least one knuckle on each leaf along the adjacent edge thereof, the knuckles having an aligned bore, a hinge pin axially extending through the aligned bore, a security stud mounted to one leaf, at least a portion of the stud being rotatable with respect to the leaf so that the stud is resistant to cutting, and an aperture in the other leaf through which the stud extends when the leaves are in an overlying position with the hinge closed.

4,131,970
QUICK-RELEASE-HINGE DEVICE

Eugene B. Le Van, 15858 El Paseo Dr., Whittier, Calif. 90603

Filed Dec. 15, 1977, Ser. No. 860,751
Int. Cl.[2] E05D 15/50
U.S. Cl. 16—147 13 Claims



1. A quick-release-hinge device arranged to be connected between a fixed-frame structure and a movable-closure member, wherein the frame structure includes a peripheral sealing mold and wherein the hinge device comprises:

a fixed-hinge member carried by said frame structure;

a releasable-hinge member releasably mounted to said closure member and releasably attached to said fixed-hinge member;

fastener means mounted to said closure member to support said releasable-hinge member in both a stationary and a movable position;

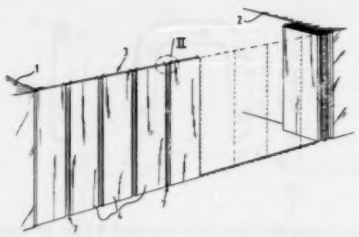
means for releasably clamping said releasable-hinge member in a locked stationary position relative to said closure member; and

stop means mounted on said releasable-hinge member whereby said hinge member is restricted in its movement when in a movable position.

4,131,971
PANEL ASSEMBLY HINGE

Pieter Saarloos, Loon op Zand, Netherlands, assignor to Breedveld Interieurwerken B.V., Rotterdam, Netherlands

Filed Apr. 1, 1977, Ser. No. 783,831
Claims priority, application Netherlands, Apr. 6, 1976, 7603602
Int. Cl.[2] E05D 7/00
U.S. Cl. 16—150 7 Claims

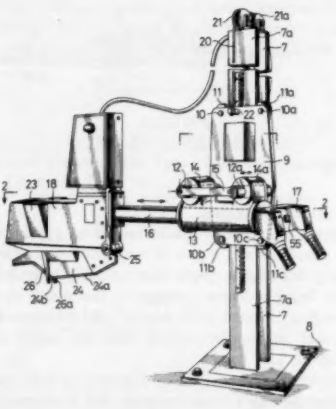


1. A hinge particularly for use between two parts to be mounted in relatively pivotable fashion, at least one part being made from compressed material, for example, board of wood cuttings, said hinge comprising a strip adhesively secured to the part of compressed material, at least one anchoring element carried by said strip, and a pliable element clamped to the anchoring element and being secured to the other part.

4,131,972
VERTICAL MEAT CHOPPER

Seiji Yamashita, 14-3, Nakamura-cho 1-chome, Minami-ku, Yokohama 232, Japan

Filed Nov. 1, 1977, Ser. No. 847,612
Claims priority, application Japan, Nov. 1, 1976, 51-131380
Int. Cl.[2] A22B 5/20
U.S. Cl. 17—23 5 Claims



1. Vertical meat chopper provided with the following mechanisms;

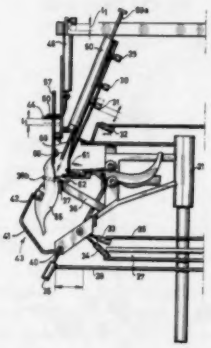
an inductive operating mechanism in X Y Z directions, comprising a base plate which slides in a vertical direction along one side of a guide post erected on a floor, a long-shaped bearing along the back and forth direction which slides in the left and right direction on two guide shafts projecting in parallel with each other from said base plate in a horizontal direction, a thrust shaft which is supported by said bearing and slides in the back and forth direction, a control handle provided at one end of said thrust shaft, and a counter-balancing weight for the total weight loaded on said base plate which is suspended on other side of said guide post;

an automatic chopping mechanism comprising a chopper casing fixed at the other end of said thrust shaft, wedge projections provided on both sides of said casing respectively, a chopper in which the one end is pivoted by said casing, the other end is left free, and along the lower edge provides a blade, a pair of stanchions both projected downward from each side of said casing in order to provide positioning, space retaining and guiding for swing-down operation of said chopper, an automatic driving means which is provided on the top of said casing and which reciprocates the middle part of said chopper in a vertical direction through a link, and an electric circuit provided near said control handle for the control of said reciprocating means.

4,131,973
DEVICE AND METHOD FOR MAKING A CUT IN THE ANAL REGION OF A BIRD

Godefridus H. W. Verbakel, Helmond, Netherlands, assignor to Stork Brabant B.V., Boxmeer, Netherlands

Filed Jan. 30, 1976, Ser. No. 654,041
Claims priority, application Netherlands, Feb. 7, 1975, 7501521
Int. Cl.[2] A22C 21/00
U.S. Cl. 17—52 2 Claims



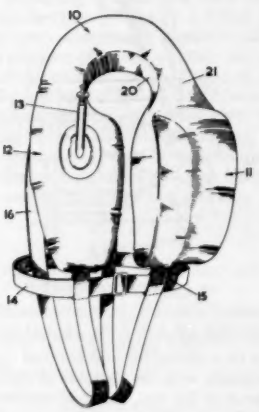
1. Device for making a cut in the anal region of a bird hanging by its legs on a conveying shackle, and comprising a first member engageable with the backside of the bird to define a stop for the back of the bird, a second member movable with respect to said first member spaced downwardly from said first member and engageable with the breast of the bird to define a stop for the breast of the bird, at least one of said first and second members having means thereon for embracing the bird in a substantially horizontal plane, a third member positioned above said first member engageable with the rear portion of the bird to define a stop for the bird in the vertical upward direction, means for moving such shackle and bird hung therefrom horizontally until the bird engages said first member and vertically upwardly until the bird contacts said third member, means for moving such second member into contact with the breast of the bird such that said first, second and third members in contact with the bird retain the bird in a fixed position, carrier means above said first and third members and reciprocable in a substantially vertical direction toward and away from the anal region of a bird retained in the fixed position, and a cutting element on said carrier member to make a cut in the anal region of the bird upon movement of the carrier means toward the bird such that an opening is made through which the intestinal tract may be withdrawn, said cutting element comprising a knife having a substantially semicircular cutting face with projecting teeth, said knife being secured at the end

of an oblong carrier which is reciprocable in the longitudinal direction thereof, and further comprising a strap movable in the direction of the first member to a position over the anal region of the bird to embrace the tail of the bird, a hook-shaped member to be introduced through the cut in the anal region and carried by said oblong carrier at right angles with the place of the hook, said hook being rotatable in a substantially vertical plane round its longitudinal axis and movable within said strap positioned around the cut in the anal region, said hook and the strap being movable toward the anal region of the bird and away therefrom, a first straight knife, movable in a substantially vertical plane, for cutting the bird from the pelvis as far as the breastbone, and a second straight knife, movable in a substantially horizontal plane, for cutting through the intestinal tract of the bird.

4,131,974
FLOTATION STOLES

Colin B. Bolton, Fleet, England, and Gerald P. Hermer, Jersey, Channel Islands, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Aug. 9, 1976, Ser. No. 712,874
Claims priority, application United Kingdom, Aug. 8, 1975, 33176/75
Int. Cl.[2] B63C *9/08*
U.S. Cl. 9—337 **9 Claims**

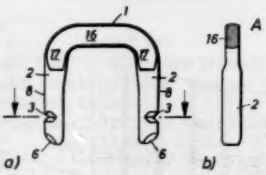


1. An inflatable flotation stole comprising a collar and a chest, the chest having a rear surface for contacting the chest area of a wearer, a front surface extending outward from the wearer and side surfaces connecting said front and rear surfaces to define a flotation cavity, the cavity having portions on either side of a center plane passing through the front and rear surfaces with the front surface on one side extending further outward from the rear surface than the front surface on the other side so that the portion on said one side has a greater capacity than the portion on said other side, the volume of the portion on said one side being greater than the volume of the portion on said other side between (a) a second plane transverse to said center plane and passing through both said portions, and (b) said front surface so that a wearer face down in the water is subjected to sufficient turning moment to position him face up, and the volume of said portion on said one side being equal to the volume of said portion on said other side between (c) said second plane, and (d) said rear surface so that a wearer face up in the water will lie in a substantially symmetrical configuration.

4,131,975
CLIP

Herbert Niedecker, Am Ellerhang 6, 6240 Königstein 2, Germany

Filed Feb. 7, 1977, Ser. No. 766,415
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1976, 2605671
Int. Cl.[2] B65D *77/18*
U.S. Cl. 24—30.5 W **8 Claims**

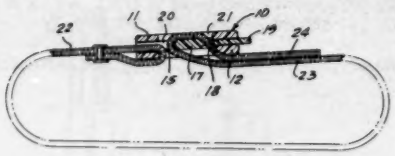


1. A U-shaped wire clip intended to be permanently deformed to enclose and close the mouth of a flexible tube or bag, comprising a pair of limbs of substantially constant cross-section and a web joined to the limbs at a pair of transition points, the cross-sections of the web and transition points differing from and having a higher section modulus than the cross-section of the limbs, the cross-sectional areas of the web, transition points and limbs being substantially constant.

4,131,976
BUCKLE

Sigurd W. Bengtsson, Bruksgatan 17, 414 51 Gotenborg, Sweden

Filed Nov. 10, 1976, Ser. No. 740,433
Claims priority, application Sweden, Nov. 17, 1975, 75128751
Int. Cl.[2] A44B *11/10*
U.S. Cl. 24—196 **2 Claims**



1. A buckle comprising:

(a) a generally annular frame including a pair of opposite side members and a pair of opposite transverse members jointly defining a single first opening bounded thereby, there being a frame passage in the plane of the frame extending through only one of said transverse members and said opening in parallel with the length of said side members; and

(b) a locking washer slidably disposed in said passage, said washer having a cross-member and a tongue-shaped extension defining opposite portions of said washer with a second opening therebetween, said cross-member dividing said single first opening into a pair of band-receptive passages therethrough, said cross-member and said second opening having a combined extent less than that of the length of said side members, said tongue-shaped extension being extendable through said one transverse member, said locking washer having a wedge-shaped projection on said extension enabling said one transverse member to be temporarily deformed for receiving said projection into said first opening and for thereafter precluding removal of said locking washer from said frame.

4,131,977

DEVICE FOR LIMITING THE ANGLE OF ADJUSTMENT OF AN ARTICULATEDLY SUPPORTED RAIL PAIR

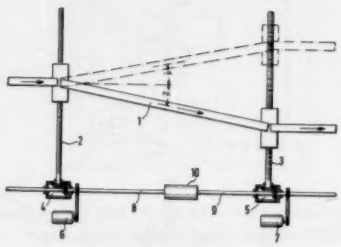
Theo Schiffers, Würselen, Fed. Rep. of Germany, assignor to H. Krantz GmbH & Co., Würselen, Fed. Rep. of Germany

Filed Mar. 16, 1978, Ser. No. 887,430

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1977, 7709567

Int. Cl.² D06C *3/02*

U.S. Cl. 26—91 3 Claims



1. In a tenter frame device including a tiltably and transversely movable rail means for guiding the chains of a tenter frame, said rail means being connected to first and second threaded parallel spindles mounted transversely to the longitudinal axis of said rail means, apparatus for moving said rail means transversely while limiting the angular relation of said rail means to said spindles comprising first and second bevel gear assemblies each including an output shaft coupled, respectively, to said first and second spindles, and an input shaft, said input shafts being coaxially aligned, independent drive means for rotating said input shafts of said gear assemblies, and angular limiter means for coupling said input shafts for conjoint rotation responsive to predetermined relative rotation of said input shafts, said limiter means comprising a sleeve threadedly connected to one said input shaft and shiftable axially relative to said shaft within predetermined limits responsive to relative rotation of said one shaft and sleeve, said sleeve being axially, slidably and non-rotatably connected to the other said input shaft.

4,131,978

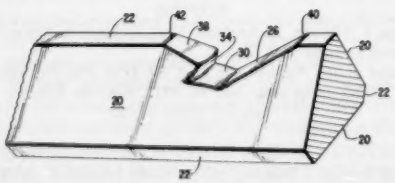
FELTING NEEDLE

Josef Zocher, Haaren, Fed. Rep. of Germany, assignor to The Singer Company, New York, N.Y.

Filed Nov. 9, 1977, Ser. No. 849,827

Int. Cl.² D04H *18/00*

U.S. Cl. 28—115 8 Claims



1. An axially extending felting needle including a point portion at the front end, a shank portion at the rear end, and a blade portion, intermediate said point and shank portions, said blade portion having at least two inclined side surfaces merging into a flat edge surface, a fiber transporting barb provided on said flat edge surface, said barb comprising a ramp inclined inwardly and rearwardly from the flat edge toward the center of the needle, a bottom surface merging at its front end with the ramp and inclined outwardly at its rear end, a fiber gripping surface merging with the rear end of the bottom surface and inclined outwardly toward the front of the needle, a barb point formed on said fiber gripping surface, said barb point being located at a depth inwardly of said flat edge surface greater than ⅔ of the total barb depth, said fiber gripping surface having a relatively large radius and fully extending between two inclined side surfaces, and a fiber deflecting surface inclined outwardly and rearwardly from the fiber gripping surface and merging into the flat edge surface.

4,131,979

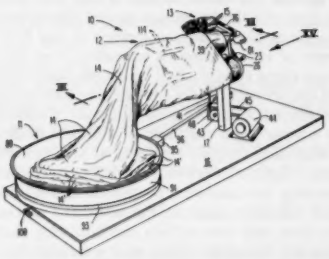
MACHINE FOR CONTINUOUS BIAS CUTTING OF TUBULAR FABRIC

J. Frank King, and Donald A. Sloan, both of Winston-Salem, N.C., assignors to Hanes Corporation, Winston-Salem, N.C.

Continuation-in-part of Ser. No. 644,569, Dec. 29, 1975. This application Apr. 11, 1977, Ser. No. 786,473

Int. Cl.² B21D *43/00*; B26D *3/16*

U.S. Cl. 29—2.19 28 Claims



1. A machine for continuously cutting plural bias strips from an advancing tube of material, including:

(a) a supply of tubular material,

(b) a plurality of cutters for cutting the tubular material into a plurality of individual strips,

(c) a rotatable mandrel for winding the cut strips of material into plural rolls,

(d) at least two skewable, transversely spaced, rotatable cylinders for supporting the tubular material internally and advancing the tubular material axially from the supply to the cutters,

(e) adjustment means for skewing the cylinders selectively relative to each other, to cause the tube of material to advance to the cutters at a selected rate of speed,

(f) material tensioning means interposed between the supply of material and the skewable cylinders, said tension means being disposed internally of the advancing tube of material,

(g) adjustment means associated with the tension means for imposing a selected tension on the advancing tube of material,

(h) sensing means for monitoring the rate of advance of the tubular material to the cutters,

(i) first control means responsive to the sensing means and automatically operative to adjust the skew angles of the cylinders, as required during machine operation, to maintain the rate of advance of the tubular material at the selected rate of speed, and

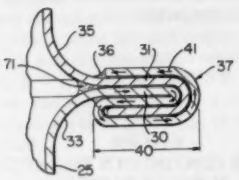
(j) second control means responsive to the sensing means and automatically operative to adjust the tension means, as required during machine operation, to maintain the tube of material substantially wrinkle-free as it advances at the selected rate of speed.

4,131,980

METHOD OF MAKING A TANK

Frederick W. Zinnbauer, 23418 Cherryhill Rd., Dearborn, Mich. 48124

Filed Sep. 7, 1977, Ser. No. 831,249
Int. Cl.[2] B21D *39/02*
U.S. Cl. 29—463 7 Claims



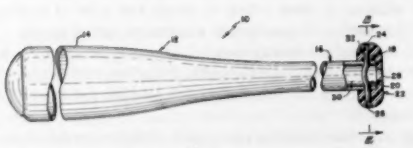
1. A method of making a metal tank for a liquid hydrocarbon comprising the steps of, forming a first tank wall terminating in a first flange, forming a second tank wall terminating in a second flange, said first flange being approximately twice the length of said second flange, applying a layer of adhesive means which is resistant to said liquid hydrocarbon as a layer thereof against one entire surface of said first flange, applying another layer of adhesive means against the surface of said first flange opposite from said one surface of said first flange, said other layer of adhesive means extending from the base of said first flange along roughly half its length, mechanically folding said first and second flanges to define an interlocking mechanical joint which cooperates with said layer of adhesive means to provide a liquid tight seal, said mechanical folding step comprising disposing roughly one half of said first flange and its associated adhesive means on one surface of said second flange and disposing the remaining portion of said first flange and its associated adhesive means on the surface of said second flange opposite from said one surface and bifolding said half length and adjoining structure during said mechanically folding step to define said joint having a plurality of six thicknesses.

4,131,981

METHOD OF SECURING A KNOB TO A BALL BAT HANDLE

Irvin C. Scott; Evan E. Settle, III, and Robert J. Hickerson, all of Richmond, Va., assignors to Reynolds Metals Company, Richmond, Va.

Division of Ser. No. 711,631, Aug. 4, 1976, Pat. No. 4,063,732. This application Sep. 1, 1977, Ser. No. 829,624
Int. Cl.[2] B21D *39/00*; B23P *11/00*
U.S. Cl. 29—505 1 Claim



1. A method of securing a ball bat body member, which terminates at one end with a hollow handle portion having a pair of aligned holes, to a knob fitted to the handle portion and having a pair of aligned holes in aligned relationship with the aligned holes in the handle portion, the knob further being provided with a third hole intermediate to the pair of aligned holes therein and in communication with the hollow of the handle portion fitted thereto, which comprises:

(a) fitting a substantially straight pin such that it extends through the pair of aligned holes in said knob and the pair of aligned holes in said handle portion;

(b) inserting a drift through the third hole in said knob; and

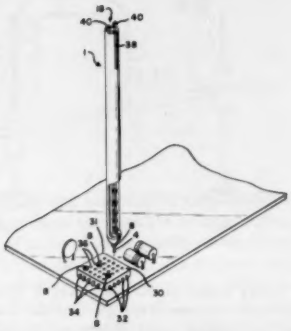
(c) striking the central portion of said pin with said drift so as to cause the pin to follow a circuitous path through the hollow of said handle portion.

4,131,982

MATRIX PIN ASSEMBLY TOOL

William H. Rose, and Richard F. Granitz, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 27, 1977, Ser. No. 846,244
Int. Cl.[2] H05K *3/30*
U.S. Cl. 29—566.2 1 Claim



1. A tool for assembling conductive contact elements into a substrate having an array of contact receiving openings, comprising:

an elongate body having first and second ends and containing an elongated supply chamber communicating with said first and second ends,

a longitudinal section of said body being open and exposing portions of a plurality of frangibly connected contact elements for feeding along said chamber toward said first end,

a resiliently expansible throat defined by said first end and being expansible upon forcible passage therethrough of an enlarged head of each contact element to allow passage of each contact element in turn from said chamber,

pressure applying means at said first end for urging each contact element in turn into a selected contact receiving opening, and

resilient jaws at said second end for gripping a selected contact for extraction of the same from a contact receiving opening.

4,131,983

ADJUSTMENT OF AVALANCHE VOLTAGE IN DIFMOS MEMORY DEVICES BY CONTROL OF IMPURITY DOPING

Walter T. Matzen, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 644,983, Dec. 29, 1975, Pat. No. 4,035,820. This application Jan. 10, 1977, Ser. No. 758,387
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—571 3 Claims

1. A method for the fabrication of a semiconductor memory device having a floating gate, a sense transistor, an electron injector and a hole injector, comprising the steps of:

a) forming a p- region in an n-type semiconductor substrate;

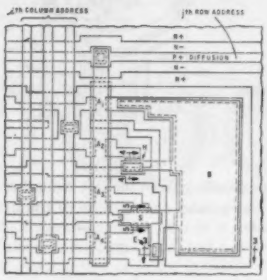
b) then forming at least three p+ regions in said substrate, one of which is contiguous with said p- region, and two others of which form the source and drain at said sense transistor;

c) then forming an n+ region in said substrate, also contiguous with said p- region;

d) then implanting an n-type region in said substrate which overlaps a portion of said n+ region and a portion of said

source or said drain, said implanted region having a dopant concentration between 5×10^{16} and 2×10^{17} cm^{-3},

e) then forming said floating gate with selected portions spaced narrowly from (1) the channel region between said source and drain, (2) the p+n+ junction formed by said



implanted region, and (3) the n+p− junction formed by said p− region and contiguous n+ region; whereby the implanted n+ region together with its overlapped p+ region forms the electron injector junction, said p− region together with its contiguous n+ region forms the hole injector region.

4,131,984

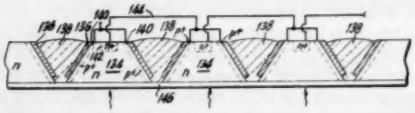
METHOD OF MAKING A HIGH-INTENSITY SOLID-STATE SOLAR CELL

Roy Kaplow, Newton, and Robert I. Frank, Cambridge, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 689,989, May 26, 1976. This application May 13, 1977, Ser. No. 796,657

Int. Cl.² B01J *17/00*

U.S. Cl. 29—572 **23 Claims**



1. The method of making a semiconductor solar cell characterized by plural spaced parallel units formed from a common wafer substrate and comprised of a first conductivity type, which method comprises cutting elongate spaced parallel grooves in the wafer, the cutting being short of totally severing discrete parallel unit-defining bodies from each other, whereby at least one of the faces of the wafer is cut by said grooves, arranging a region of a second conductivity type in at least one groove wall of each of said bodies, providing separate conductive connections establishing ohmic contact between the second-conductivity-type region of one unit and the first-conductivity-type region of the next-adjacent unit, such ohmic contacts being thus established progressively from unit to unit in a single direction of traverse of all said units, consolidating the wafer by filling the grooves, and then completing the severance of units from each other while relying upon the consolidated groove filling to assure the positional integrity of the separated units.

4,131,985

THIN SILICON DEVICES

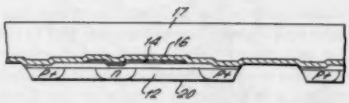
John C. Greenwood, and John M. Young, both of Harlow, England, assignors to ITT Industries, Inc., New York, N.Y.

Filed Jun. 24, 1977, Ser. No. 809,583

Claims priority, application United Kingdom, Aug. 31, 1976, 35977/76

Int. Cl.² B01J *17/00*

U.S. Cl. 29—580 **10 Claims**



1. A method of making a semiconductor structure, comprising:

forming at least one semiconductor device on a surface of a polished silicon slice;

framing said at least one device with a deep diffusion of boron;

bonding a substrate to the surface of the polished silicon slice;

isolating said at least one device by isotropic etching of the silicon slice about the boron diffused frame to form an isolating moat; and

removing the silicon from beneath said at least one device using selective lateral etching of the silicon slice from the moat so as to expose said device.

8. A method of making a semiconductor structure including:

forming at least one semiconductor device in the surface of a polished silicon slice;

framing said at least one device with a deep diffusion of boron;

coating the surface of said slice with a layer of silicon nitride;

fusing the surface of said slice by way of said silicon nitride layer to a glass ceramic material in its glass phase;

devitrifying said glass ceramic material to form a ceramic layer;

isolating said at least one device by isotropic etching; and

removing the silicon from beneath said at least one device with a selective etch so as to expose said device.

4,131,986

ELECTROSTATIC RECORDING HEAD HAVING WIRE STYLI AND METHOD OF MANUFACTURE

Vincent R. Escriva, Santa Clara; Suvrat Kirtikar, Stanford; Edward W. Marshall, Saratoga, and Charles D. Minard, Sunnyvale, all of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 59,269, Jul. 29, 1970, abandoned. This application Sep. 15, 1972, Ser. No. 289,407

Int. Cl.² B21F *3/00;* **G11B** *3/44*

U.S. Cl. 29—592 R **10 Claims**

1. A method of making a wire styli electrostatic recording head comprising the steps of:

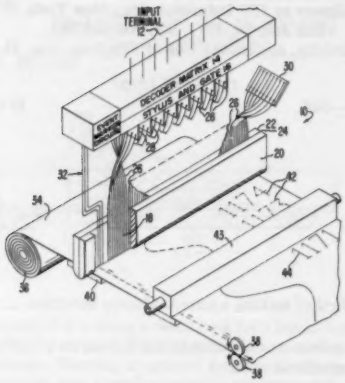
providing a revolving surface for receiving the wires which form the styli and leads therefor;

placing an adhesive on the revolving surface for retaining the wires in position on said surface;

laying electrically conductive wire in an adjacent configuration onto the adhesive as the surface revolves to form a wire-adhesive helix member having at least one layer of wires;

forming a wire-adhesive sheet by completely severing the wire-adhesive helix member across the direction of the wires and removing it from the revolving surface; and

fabricating a recording head by mounting one end of the wire sheet in a recording head structure and leaving the



other end of the wire sheet extending from the recording head structure to form the lead wires.

4,131,987

METHOD OF PRODUCING A MICROWAVE FILTER COMPRISING A BODY OF GYROMAGNETIC MATERIAL AND A SOURCE OF A PREPOLARIZING MAGNETIC FIELD WHOSE RESONANT FREQUENCY IS A PREDETERMINED FUNCTION OF THE TEMPERATURE

Klaus J. Pavlik, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 28, 1977, Ser. No. 810,667

Claims priority, application Netherlands, Aug. 2, 1976, 7608560

Int. Cl.² H01P *11/00*

U.S. Cl. 29—593 **1 Claim**

1. A method of fabricating a microwave filter with a resonant frequency which is a predetermined function of temperature, said filter having a gyromagnetic element and a source of a pre-polarizing magnetic field, said method comprising the steps of inserting into the filter structure a reference gyromagnetic element with a predetermined orientation relative to said magnetic field, adjusting the resonant frequency of the filter to a predetermined value by changing the magnetic field, removing said reference element from the filter structure, inserting into the filter structure a second gyromagnetic element of the same dimensions and composition as said reference element, adjusting the orientation of said second element until the resonant frequency of the filter is equal to said predetermined resonant frequency and locking said second element in that position.

4,131,988

METHOD OF MANUFACTURING A DYNAMOELECTRIC FIELD MEMBER

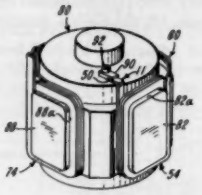
Hyman B. Finegold, Dayton, Ohio, assignor to The Globe Tool and Engineering Company, Dayton, Ohio

Filed Oct. 29, 1976, Ser. No. 736,880

Int. Cl.² H02K *15/04*

U.S. Cl. 29—596 **29 Claims**

1. The method of winding field coils for dynamoelectric apparatus comprising forming plural core pieces in circumferentially spaced positions on a mandrel, winding coils about said core pieces with a continuous length of strapping, each of said coils having plural convolutions and having an axis intersecting said mandrel, the winding of each coil progressing from a first convolution nearest said mandrel axially outwardly along its said axis to a last convolution farthest from said mandrel, and forming connecting portions from said continuous length



of strapping extending from the last wound convolution of one coil to the first wound convolution of the next wound coil.

4,131,989

METHOD OF MANUFACTURING AN ELECTRIC MOTOR

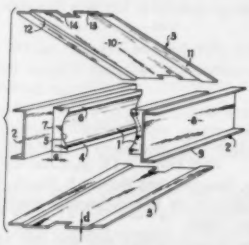
Pierre Periou, Cergy, France, assignor to Compagnie Industrielle de Mecanismes, Neuilly-Sur-Seine, France

Filed Mar. 3, 1977, Ser. No. 774,023

Claims priority, application France, Mar. 19, 1976, 7608113

Int. Cl.² H02K *15/02*

U.S. Cl. 29—596 **4 Claims**

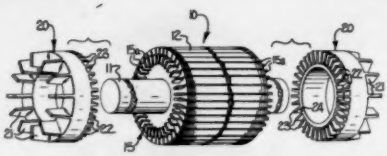


1. A method for producing an electric motor comprising a rotor having a shaft and a stator, the stator having a frame of a material selected from a group consisting of iron and magnetic sheet and comprising two support elements, two magnetic blocks in confronting relation respectively fixed to the two supports, two covers of a material selected from a group consisting of iron and magnetic sheet attached to the support elements on each side of the magnetic blocks and interconnecting the support elements, two end elements supporting the shaft of the rotor and respectively disposed at each end of the frame, and positioning means at opposite ends of the covers/and positioning means on the end elements which are complementary to and cooperative with the positioning means of the covers; said method comprising constructing the stator by fixing the two magnetic blocks respectively on the two support elements, applying the magnetic blocks on each side of a jig having a longitudinal shaft and having a diameter equal to the defined inside diameter of the stator, employing two second end elements to support the two ends of the shaft of the jig and to position the two covers relative to the support elements, attaching the two covers to the support elements on each side of the magnetic blocks so as to construct the frame, withdrawing the jig and the two second end elements supporting the jig shaft, inserting the rotor and the rotor shaft into the frame, and fixing at each end of the frame the end elements of the motor for supporting the shaft of the rotor, by using the covers for positioning the end elements for supporting the shaft of the rotor.

4,131,990
METHOD OF MAKING SQUIRREL CAGE ROTOR

Thomas A. Roach, Denver, N.C., assignor to Service First, Inc., Charlotte, N.C.

Division of Ser. No. 570,511, Apr. 22, 1975, Pat. No. 4,064,410.
This application Oct. 3, 1977, Ser. No. 838,466
Int. Cl.² H02K *15/02*
U.S. Cl. 29—598 **3 Claims**



1. In a method of installing rotor bars in a dynamoelectric machine rotor of the type having a shaft and a generally cylindrical laminated magnetic core mounted coaxially on the shaft, with the core having a plurality of arcuately spaced longitudinal passageways therethrough for accommodating the rotor bars, the steps comprising:

inserting the rotor bars in said passageways with end portions of the rotor bars protruding beyond the end laminations at opposite ends of the core,

positioning an end ring over the shaft at each end of the laminated core, each end ring having an inner end portion facing said core provided with a series of arcuately spaced radially extending ribs therearound with intervening arcuately spaced radially extending channels being defined between successive ribs,

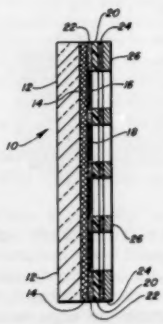
guiding each end ring toward and into engagement with the end portions of the rotor bars protruding beyond the end laminations of the core and axially compressing the end rings toward one another so that the protruding end portions of the rotor bars are received in the channels of the end rings and the ribs bear tightly against the end laminations of the core at arcuately spaced locations thereover to maintain the laminations of the core immobilized and in tightly compressed condition, and

welding the protruding end portions of the rotor bars positioned in the channels to the end rings while maintaining the end rings and the core under said axial compression.

4,131,991
METHOD OF MAKING FLEXIBLE PRESSURE SENSITIVE SWITCH

James P. Riniker, Sparta, Wis., assignor to Northern Engraving Company, Inc., Sparta, Wis.

Division of Ser. No. 620,955, Oct. 9, 1975, Pat. No. 4,035,593.
This application May 11, 1977, Ser. No. 796,002
Int. Cl.² H01H *11/00*
U.S. Cl. 29—622 **4 Claims**



1. A method for manufacturing a unitary, self-biasing and flexible switching element which includes a flexible and electrically non-conductive substrate, a plurality of electrically conductive contact area means carried by the substrate, indicia carried by said substrate and in aligned relation to said contact area means so as to indicate individual contact areas which may be activated, and apertured insulating and bonding means carried by said substrate and in surrounding relationship with each of said contact area means, said method including the steps of:

providing flexible and electrically non-conductive substrate;

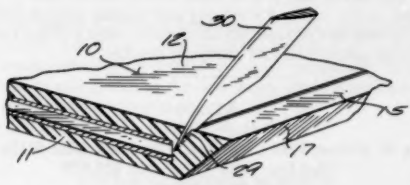
printing said contact area means on one side of said substrate with silver; and

applying said apertured insulating and bonding means to the same side of said substrate as said contact area means and in surrounding relationship to said contact area means so as to insulate contact area means from one another and so as to permit said element to be bonded to a surface.

4,131,992
METHOD OF RE-CONDITIONING MAT SWITCHES

James L. Stefaniak, Greenfield, Wis., assignor to S & H Moonlight Design Industries, Inc., St. Francis, Wis.

Filed Sep. 6, 1977, Ser. No. 830,726
Int. Cl.² H01H *11/00*
U.S. Cl. 29—622 **8 Claims**



1. In a process for reconstructing a floor mat switch having contact plates, separators, and a plastic cover, the steps of

(1) making a cut at a 45° angle to the mat surface in a manner so that the cut extends from the mat surface into the space between the contact plates, said cut extending on all sides of the mat which do not contain the electric contact cord,

(2) opening the mat about the remaining uncut side as a hinge to a maximum of 135°,

(3) cutting the electric cord flush with the inside and outside surfaces of the mat,

(4) removing all contents of the mat cover,

(5) cleaning the contact plates of all foreign matter,

(6) Drilling out the electric wires where they pass through the mat cover,

(7) threading new electric wire through a hole formed by the drilling out step and sealing the wire to the cover,

(8) attaching said electric wire to the contact plates,

(9) adhesively affixing separator buttons to the surface of a contact plate,

(10) adhesively affixing separator strips to the edge of the bottom plate leaving at least one gap in the separator strips at each of two opposed sides,

(11) replacing the contact plate with the associated separator buttons and strips in the mat cover, and

(12) completely sealing the cut in the cover.

4,131,993
MEANS FOR ENGAGING A SLIDER AUTOMATICALLY ON A SLIDE FASTENER CHAIN

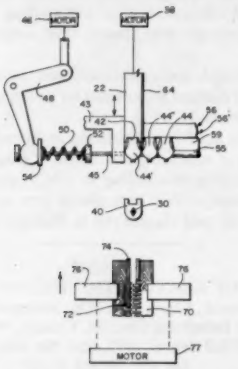
Anthony A. Azzara, Brooklyn, N.Y., assignor to Bruning Brothers Company, Inc., Commack, N.Y.

Filed Aug. 22, 1977, Ser. No. 826,728
Int. Cl.² B29D *5/00*
U.S. Cl. 29—768 **10 Claims**

1. A mechanism for assembling a slider with a pair of slide fastener tapes having chains of teeth thereon, comprising:

a carrier;

a clamping member pivotally carried by said carrier and arranged in cooperation with said carrier to hold one slider in position to be threaded on a pair of slide fastener tapes;



a movable support for a pair of said tapes arranged to present one end of said pair of tapes to said carrier; and

first motive means for moving said support so that said end of said pair of tapes simultaneously enter a slider held by said carrier and said clamping member.

4,131,994

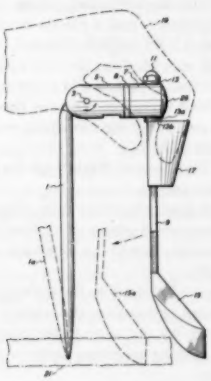
HAND TOOL

John W. Absher, 9710 Laird Ave., Cleveland, Ohio 44102

Filed Dec. 8, 1977, Ser. No. 858,679

Int. Cl.[2] B26B *11/00*

U.S. Cl. 30—148 **13 Claims**



1. A device comprising, in combination, a handle, a skewer means pivotally mounted on said handle; a swivel block attached to said handle at the opposite end from said skewer, a utility shaft rotatably mounted on said swivel block.

4,131,995

SMOOTHING COMB FOR A HAIR TRIMMER

Antonio Pires, Wallingford, Conn., assignor to Sperry Rand Corporation, Bridgeport, Conn.

Filed Aug. 17, 1977, Ser. No. 825,333

Int. Cl.[2] B26B *19/20, 19/38*

U.S. Cl. 30—200 **16 Claims**

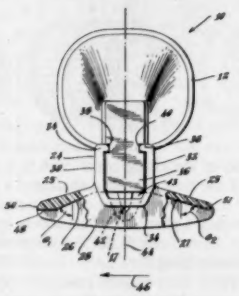
1. An improved power driven hair trimmer for smoothing hair comprising;

a. a power driven hair trimmer;

b. said hair trimmer having a cutter including an elongated row of cutter for shearing hair which extend between said teeth;

c. a comb member demountably positioned on said hair trimmer for transport therewith;

d. said comb member including an elongated recess formed therein, said comb member being positioned on said hair trimmer with the elongated row of cutter teeth depending into said recess and extending longitudinally thereof,



guide means extending transversely of the recess for guiding hair strands past said row of cutter teeth, and limiting means transversly displaced with respect to said elongated recess and located between said guide means for limiting extension of guided hair strands into said recess and between said cutter teeth for restricting the trimming of guided hair strands having a length greater than a predetermined length which bridge said recess.

4,131,996

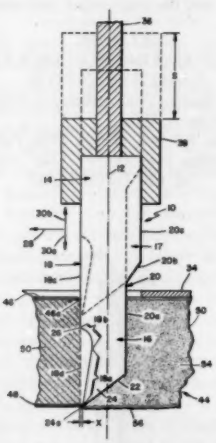
BLADE FOR CUTTING WALLBOARD

William R. Janke, Rte. #3, Northfield, Minn. 55057

Filed Jun. 27, 1977, Ser. No. 810,624

Int. Cl.[2] B26B *7/00*

U.S. Cl. 30—273 **14 Claims**



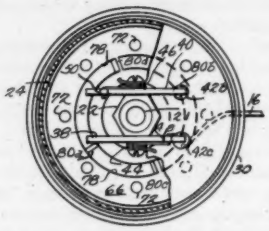
11. The combination with a sabre saw including a reciprocal blade holder, an elongated blade comprising an end portion held by said holder and a cutting end portion having a chisel point, said cutting end portion being formed by a smooth forward edge and smooth end edge, said forward and end edges extending at an acute angle with respect to each other and being blunt or flat from one side of said cutting end portion to the other side thereof to form said chisel point.

4,131,997

VEGETATION CUTTING APPARATUS HAVING A SEMIAUTOMATICALLY DISPENSED FLEXIBLE LINE CUTTING ELEMENT

Gordon F. Utter, 32019 E. I-10, Redlands, Calif. 92373

Filed Jul. 5, 1977, Ser. No. 812,739
Int. Cl.[2] A01G *3/06*
U.S. Cl. 30—276 **5 Claims**



1. A vegetation cutting apparatus of the type having a rotatably driven head assembly housing a spool upon which a flexible line is wound, a free end of said line extending through an aperture in said assembly to engage vegetation when said assembly is rotated, said apparatus comprising:

detent means secured to said head assembly, said detent means normally contacting first and second stop elements on said spool to cause the spool to rotate with the head assembly when said assembly is rotated, said detent means including:

a first spring-loaded rocker arm pivotally mounted intermediate its ends and having one end portion normally biased by said spring to a position enabling contact with said first stop element and having its opposite end portion biased by said spring to a position preventing contact with said spool; and

a second spring-loaded rocker arm pivotally mounted intermediate its ends and having one end portion normally biased by its spring to a position enabling contact with said second stop element and having its opposite end portion biased by its associated spring to a position preventing contact with said spool; and

means for selectively actuating the detent means during rotation of the head assembly to release the spool from contacting relationship with the detent means thereby permitting limited relative rotation between the head assembly and the spool, said detent actuating means including:

means selectively engaging the rocker arms to simultaneously pivot said arms in opposition to the forces of their respective springs to remove said one end portions of the arms form said contact-enabling positions and to move said opposite end portions into positions whereby the opposite end of said second rocker arm is enabled to contact the first-mentioned stop element and the opposite end of said first rocker arm is enabled to contact said second stop element whereby limited relative rotation of the head assembly and the spool is permitted.

4,131,998

TUMOR GROWTH MEASUREMENT DEVICE

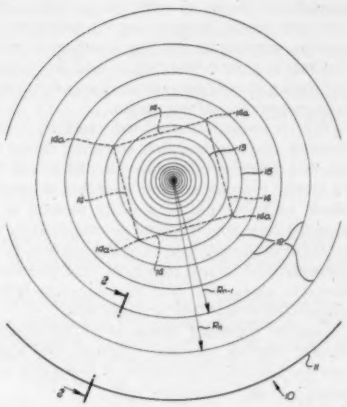
Colin P. Spears, 4901 Oak Terrace Dr., Los Angeles, Calif. 90042

Filed Mar. 9, 1977, Ser. No. 775,779
Int. Cl.[2] G01B *11/28, 3/14*
U.S. Cl. 33—1 C **9 Claims**

1. A device for measuring the projected area of a tumor and thus determining volumetric growth of the tumor, comprising,

(a) a translucent sheet to be placed in registration with a tumor or representation thereof,

(b) the sheet defining a plane and carrying concentric indicating circles in said plane whereby the center of the circles may be placed in registration with the central visible portion of the tumor or representation, the sheet having a surface and the circles located proximate said surface,



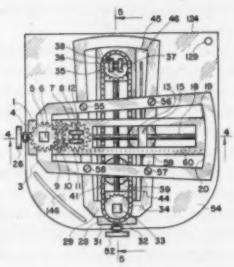
(c) the radius R_n of each indicating circle "n" being approximately 1.26 times the radius of the next smaller indicating circle, whereby an increase in tumor peripheral size from one of said circles to the next larger circle is indicative of tumor volume doubling.

4,131,999

VARI-SCALE-STYLE SCRIBER

Hyok S. Lew, 1620 E. Blacklidge Dr. #6, Tucson, Ariz. 85719

Filed Sep. 17, 1973, Ser. No. 398,146
Int. Cl.[2] B43L *13/10*
U.S. Cl. 33—23 R **7 Claims**



1. A device for transmitting the movement of a tracing implement to the movement of a scribing implement, said device constituting an essential element of a transcribing apparatus capable of transcribing characters from a template onto a drawing surface in varying sizes and styles; said device comprising:

(e) a base-plate

(a) a first pivoting arm pivotally secured to a first post near one extremity of said first pivoting arm, said first post being nonrotatably secured to said base-plate whereby, said first pivoting arm is pivotable about said first post on a plane parallel to said base-plate with respect to said base-plate, said first pivoting arm including:

(2) a first rotating member rotatably secured to a second post, said second post secured to said first pivoting arm immediate said first post and the other extremity of said first pivoting arm; whereby, said first rotating member is rotatable relative to said first pivoting arm about an axis perpendicular to said base-plate;

(3) a first nonrotating member nonrotatably secured to said first post;

(4) a first means for interconnecting said first rotating member and said first nonrotating member; whereby, pivotal movement of said first pivoting arm in one direction results in equal angular rotation of said first rotating member in another direction to maintain the constant angular orientation of said first rotating member during pivotal movement of said first pivoting arm with respect to said base-plate;

(5) a first receiving means affixedly secured upon said first rotating member, said first receiving means aligned in the first direction on a plane parallel to said base-plate;

(6) a second rotating member rotatably secured to a first block, said first block movably secured to said first pivoting arm; whereby, said second rotating member is rotatable relative to said first pivoting arm about an axis perpendicular to said base-plate, and said first block is movable along said first pivoting arm between two extremities of said first pivoting arm;

(7) a second receiving means affixedly secured to said second rotating member; whereby, the alignment of said second receiving means is changable on a plane parallel to said base-plate; and

(8) a first mean of changing and setting the position of said first block movably secured to said first pivoting arm;

(b) a second pivoting arm pivotally secured to a third post near one extremity of said second pivoting arm, said third post being nonrotatably secured to said base-plate; whereby, said second pivoting arm is pivotable about said third post on a plane parallel to said base-plate with respect to said base-plate, said second pivoting member including:

(2) a third rotating member rotatably secured to a fourth post, said fourth post secured to said second pivoting arm intermediate said third post and the other extremity of said second pivoting arm; whereby, said third rotating member is rotatable relative to said second pivoting arm about an axis perpendicular to said base-plate;

(3) a second nonrotating member nonrotatably secured to said third post;

(4) a second means for interconnecting said third rotating member and said second nonrotating member; whereby, pivotal movement of said second pivoting arm in one direction results in equal angular rotation of said third rotating member in another direction to maintain the constant angular orientation of said third rotating member during pivotal movement of said second pivoting arm with respect to said base-plate;

(5) a third receiving means affixedly secured upon said third rotating member, said third receiving means aligned in the second direction on a plane parallel to said base-plate;

(6) a fourth rotating member rotatably secured to a second block, said second block movably secured to said second pivoting arm; whereby, said fourth rotating member is rotatable relative to said second pivoting arm about an axis perpendicular to said base-plate, said second block is a movable along said second pivoting arm between two extremities of said second pivoting arm;

(7) a fourth receiving means affixedly secured to said fourth rotating member; whereby, the alignment of said fourth receiving means is changable on a plane parallel to said base-plate; and

(8) a second means of changing and setting the position of said second block movably secured to said second pivoting arm;

(c) means for connecting a tracing implement to said device, said means including:

(1) a first rod having means of connecting a tracing implement to one extremity of said first rod,

(2) a first rail aligned in said second direction and rigidly connected to said first rod, said first rail slidably engaging said third receiving means; and

(3) a second rail aligned in said first direction and rigidly connected to said first rod, said second rail slidably engaging said second receiving means; whereby, the constant angular orientation of said first rod is maintained during shifting movement of said first rod on a plane parallel to said base-plate;

(d) means for connecting a scribing implement to said device, said means including:

(1) a second rod having means of connecting a scribing implement to one extremity of said second rod;

(2) a third rail aligned in said first direction and ridigly connected to said second rod, said third rail slidably engaging said first receiving means; and

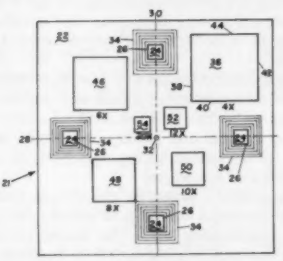
(3) a fourth rail aligned in said second direction and rigidly connected to said second rod, said fourth rail slidably engaging said fourth receiving means, whereby, the constant angular orientation of said second rod is maintained during shifting movement of said second rod on a plane parallel to said base-plate.

4,132,000

APPARATUS AND METHOD FOR MAKING GUN TARGETS

Charles R. Dulude, 33 Burnside Ave., East Hartford, Conn. 06108

Filed Feb. 8, 1977, Ser. No. 766,716
Int. Cl.[2] G01B 3/14
U.S. Cl. 33—174 B **13 Claims**



1. An apparatus for making gun targets having sighting areas optimized for a particular gun scope and gun to target distance for shot grouping comprising:

a base having a first axis and a second axis orthogonal to the first axis wherein the first axis and the second axis intersect at a geometric center of the base;

a first pilot hole located on the first axis within the base;

a second pilot hole located within the base on the second axis wherein the first and second pilot holes are located equidistant from the geometric center and are adapted for aligning the sighting areas on the gun target;

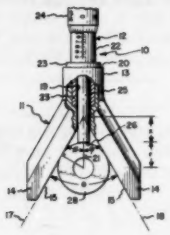
a plurality of lines of space control symmetrically disposed in a spaced apart relationship about each of the first and second pilot holes wherein the lines of space control are adapted for varying the width of the sighting area on a target to optimize the target; and

an aperture within the base having a first side substantially parallel to the first axis and a second side substantially parallel to the second axis wherein the first side and the second side are located within the base equidistant from the first and and second axis respectively and the aperture is adapted for defining the sighting area on the target and has dimensions inversely proportional to the power of the gun scope.

4,132,001
DIRECT READING RADIUS GAUGE

Konrad Petrik, 205 Meadowlawn Rd., Cheektowaga, N.Y. 14225

Filed Nov. 2, 1977, Ser. No. 847,770
Int. Cl.[2] G01B 5/08, 3/18
U.S. Cl. 33—178 D 2 Claims



1. Apparatus adapted to indicate directly the numerical value of the radius of an object in one of the English and Metric systems of measurement, comprising:

a Y-shaped frame including a base and two divergent legs extending outwardly therefrom, each of said legs having a planar surface arranged to face the other of said legs, said planar surfaces intersecting in a line perpendicular to the longitudinal extent of each leg, said base having a cylindrical opening therethrough, the axis of said opening being arranged to intersect said line of intersection and arranged to bisect the angle of divergence between said planar surfaces; and

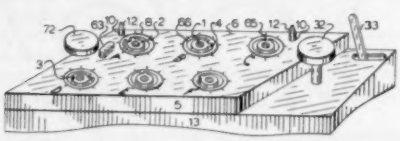
a micrometer head originally intended to read in the other of said English and Metric systems of measurement and having a sleeve mounted on said base about said opening, having a thimble rotatably mounted on said sleeve, and having a spindle associated with said sleeve and thimble and operative to move axially of said opening in response to rotational movement of said thimble relative to said sleeve, said spindle having a planar end face perpendicular to the axis of said opening, said sleeve and thimble having cooperative numerical scale elements representative of numerical quantities to be measured, said scale elements reading zero when said line of intersection lies in the plane of said spindle end face; and wherein

the angle of divergence is selected such that the sine of half of said angle of divergence between said planar surfaces is substantially equal to the amount of a known radius divided by the amount of said known radius plus the amount of the extent of axial displacement of said spindle end face beyond said line of intersection when said cooperative scale elements indicate the number of said known radius.

4,132,002
DIAL SETTING DEVICE

Robert E. Shockovsky, 4016 Landside Dr., Louisville, Ky. 40220

Filed Jan. 3, 1977, Ser. No. 756,121
Int. Cl.[2] G01B 5/00
U.S. Cl. 33—180 R 28 Claims



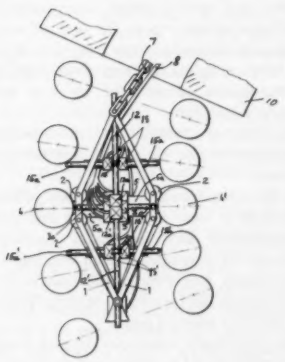
1. In a control shaft group having a plurality of rotatable shafts, each shaft having a shaft stop member including a medially projecting lug, the combination with said rotatable shafts of a dial setting device for setting each rotatable shaft which comprises: a secondary stop assembly including a plate comprising;

1. an annular opening for registry with each of said control shafts;
2. a secondary stop member in each of said openings for engagement by the shaft stop member of the related control shaft upon the rotation of the shaft to establish a correct dial setting, and
3. positioning means for positioning said secondary stop assembly in registry with said control shaft group.

4,132,003
APPARATUS FOR MEASURING CURVATURE AND OTHER GEOMETRIC RELATIONS OF DUAL ROLLER TRACKS

Hans Schrewe, Duisburg, and Fritz P. Pleschiutschnigg, Dusseldorf, both of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf and Gustav Wiegard Maschinenfabrik, Witten, both of Fed. Rep. of Germany.

Filed Aug. 25, 1977, Ser. No. 827,570
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1976, 2639241
Int. Cl.[2] G01B 7/00, 7/28
U.S. Cl. 33—182 4 Claims



1. Apparatus for measuring and testing the relative disposition of rollers of two roller tracks facing each other across a transport path that separates the two tracks and through which objects are moved by and in engagement with the rollers of the two tracks on opposite sides, the apparatus comprising:

an expandable and foldable frame having two opposite corner portions movable toward and away from each other and in which are mounted two sets of centering rolls for engagement with two rollers of the two tracks facing each other across the path;

first feeler means in the frame disposed for sensing the distance between the two engaged rollers of the two tracks from a common reference plane extending parallel to the axes of the two rollers;

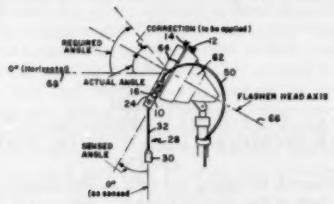
second and third feeler means mounted in the frame in adjustably spaced disposition to said common reference plane and each respectively measuring distances of rollers of the two tracks with respect to said reference plane, whereby the second feeler means are adjustably positionable for measuring engagement with two rollers, respectively, of the two tracks to one side of the rollers engaged by the first feeler means, and the third feeler means are adjustably positionable for measuring engagement with two rollers, respectively, of the two tracks to the other side of the rollers engaged by the first feeler means.

4,132,004

REMOTE FIXTURE AIMING DEVICE

Charles E. Deschenes, Marblehead, and Jeffrey D. Ingalls, Ipswich, both of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Continuation of Ser. No. 653,992, Jan. 30, 1976, abandoned. This application Aug. 15, 1977, Ser. No. 824,355
Int. Cl.[2] G01C 9/06
U.S. Cl. 33—366 1 Claim



1. In combination an adjustable remote lighting fixture mounted on a tower, said fixture including a light source having a face at a right angle to the optical axis thereof, and a sensing system for measuring the angle of aim of said fixture, which angle is that between the horizontal plane and said optical axis, said sensing system comprising:

a bracket attached across the face of said light source; a pendulum suspended from a lower portion of said bracket at a location below the face of said light source for a range of movement unrestricted by said bracket and light source;

a potentiometer mounted on said bracket and having an adjustable center tap with a rotatable shaft attached thereto;

means for mechanically coupling said pendulum to the rotatable shaft of said potentiometer; said pendulum, bracket, potentiometer and mechanical coupling means being a remotely located assembly on said lighting fixture;

circuit means including a microammeter having a scale calibrated in degrees and a battery for providing a source of electrical energy; and

a cable electrically connected to said potentiometer of the remotely located assembly and having a plug for connection to said circuit means to thereby form a resistance bridge, whereby during operation of said sensing system with said pendulum mounted on and freely suspended from said remote fixture, the readout of said microammeter is proportional to the angle formed between said pendulum and said face of the

light source, which angle is equal to said angle of aim;

said circuit means comprising a pair of energy input terminals connected to said battery through an on/off switch, a first variable resistor connected across said energy input terminals and having a variable center tap, means connecting one terminal of said microammeter to the center tap of said first variable resistor, said cable and plug being operable to connect said potentiometer of the remotely located assembly across said first variable resistor and to connect the center tap of said potentiometer to the other terminal of said microammeter, whereby said microammeter is series connected between the center taps of said potentiometer and first variable resistor, the center tap of said first variable resistor being adjustable for setting said meter to zero degrees in calibration with the zero degree position of said pendulum, and a current reversing switch coupled between said battery and said variable resistor for enabling measurement of either positive or negative angles of said pendulum, thereby facilitating correction of said angle of aim when said tower is in a lowered position.

4,132,005

FLUIDIZATION OF PERMANENTLY MAGNETIC PARTICLE BEDS

Costas A. Coulaloglou, Morristown, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Aug. 2, 1977, Ser. No. 821,168
Int. Cl.[2] F26B 3/10
U.S. Cl. 34—10 8 Claims

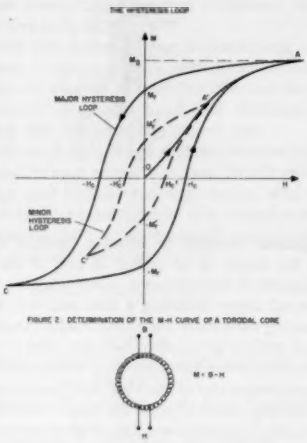


FIGURE 2. DETERMINATION OF THE M-H CURVE OF A TOROIDAL CORE

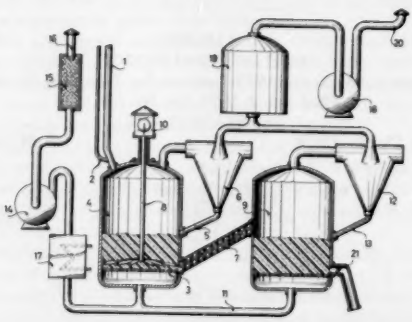
1. A fluidized bed process operated in the absence of an externally applied magnetic field which comprises passing a fluidizing gas upwardly through a substantially non-bubbling bed of fluidizable permanently magnetized particles at a velocity of at least twice the minimum fluidizing gas velocity required to fluidize the bed, said permanently magnetized particles having a coercivity of at least 50 oersteds.

4,132,006

PROCESS FOR DRYING CHLORINATED POLYMERS

Manfred Scholz, Hürth; Karl Kaiser, and Horst Semmler, both of Brühl, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 12, 1977, Ser. No. 814,862
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1976, 2632054
Int. Cl.[2] F26B 3/08, 3/10
U.S. Cl. 34—10 12 Claims



1. In a process for drying a post-chlorinated polyolefin which has been obtained by a filter separation procedure in moist form, the improvement which comprises atomizing the

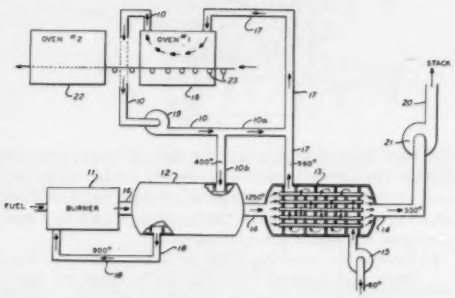
filtered moist post-chlorinated polyolefin, introducing the resulting polyolefin continuously into a first continuously operated fluidized bed drying zone provided with an agitator and pre-drying the polyolefin therein by means of a drying gas, introducing the pre-dried polyolefin into at least one further batchwise operated fluidized bed drying zone downstream of the first fluidized bed drying zone and completely drying the polyolefin therein by means of the drying gas, the drying gas admitted to the first and second fluidized bed drying zones being heated to a temperature of 50 to 150° C.

4,132,007

SINGLE BURNER HEATER AND INCINERATOR

James T. Voorheis, 53 Park La., Essex Fells, N.J. 07021

Filed Aug. 17, 1977, Ser. No. 825,257
Int. Cl.[2] F26B *3/04*
U.S. Cl. 34—35 **8 Claims**



1. A single burner heater and incinerator comprising:
a. a burner,
b. a first indirect heat exchanger,
c. a second indirect heat exchanger,
d. a conduit from the burner passing through the first and second heat exchangers,
e. a means to supply make-up air to the second heat exchanger in indirect heat exchange relation to the conduit passing therethrough,
f. an oven,
g. a first duct for conducting the make-up air from the second heat exchanger to the oven,
h. a second duct for conducting the atmosphere from the oven through a first bifurcated portion in part to the first duct, and in part through a second bifurcated portion to the first heat exchanger in indirect heat exchange relation to the conduit passing therethrough,
i. a third duct for conducting air from the first heat exchanger to the burner.

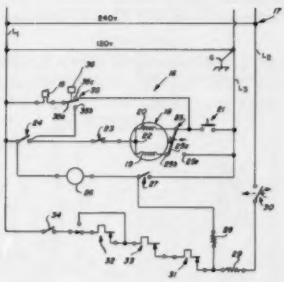
7. A method for heating and incinerating in a system using a single burner comprising:
a. burning fuel in a burner,
b. passing the products of combustion through a conduit, through a first indirect and a second indirect heat exchanger,
c. passing make-up air through the second heat exchanger in indirect heat exchange relation to the conduit therethrough,
d. passing the make-up air from the second heat exchanger to an oven,
e. passing the atmosphere from the oven in part to mix with the make-up air from the second heat exchanger to return into the oven,
f. passing the other part of atmosphere from the oven to the first heat exchanger in indirect heat exchange relation to the conduit therethrough,
g. passing atmosphere from the first heat exchanger to the burner,
h. processing material in the oven.

4,132,008

CONTROL CIRCUIT FOR DRIER

Clifford L. Deschaaf, Stevensville, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jun. 3, 1977, Ser. No. 803,344
Int. Cl.[2] F26B *11/04*
U.S. Cl. 34—45 **12 Claims**



1. In a drier apparatus having a drum drive motor for operation from an electrical power supply, a timer having a timed switch for providing a timed power circuit connection from said power supply to said drive motor, and a centrifugal switch for providing a power circuit connection of the drive motor to the power supply when the drive motor is rotating above a preselected speed, with said timed switch, said drive motor, and said centrifugal switch connected in series across said power supply, the improvement comprising:
a buzzer;
a first switch means for selectively connecting said buzzer in parallel with said timed switch only;
a second switch means for selectively connecting said buzzer in parallel with said series connected timed switch, drive motor, and centrifugal switch; and
means for selectively connecting said buzzer through said first and second switch means whereby said buzzer is operated during operation of the drive motor whenever said second switch means is disposed to connect said buzzer in parallel with said series connected timed switch, drive motor, and centrifugal switch with the drive motor operating above said preselected speed, and is operated whenever said first switch means is disposed to connect said buzzer in parallel with said timed switch upon disconnection of said drive motor by said timed switch at the end of a drive motor operating cycle and until the motor slows to said preselected speed.

4,132,009

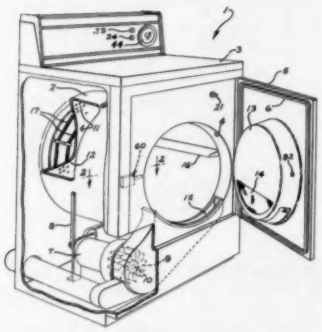
START SYSTEM FOR DOMESTIC APPLIANCE

John Bochan, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed May 27, 1977, Ser. No. 801,178
Int. Cl.[2] F26B *11/04*
U.S. Cl. 34—45 **6 Claims**

1. In a domestic appliance having clothes tumbling means with an opening to receive the clothes, a drive motor for driving the tumbling means, said drive motor having a start winding and a run winding, and a cabinet enclosing the tumbling means and the drive motor and including a door for access to the tumbling means opening, a control system for energizing the drive motor from a power supply, including a control mechanism having a drive motor switch, a door switch operated by the door, said door switch being open when the door is open and closed when the door is closed, a drive motor circuit for energizing the drive motor through the drive motor switch and the door switch, the circuit including a manually operable start switch connected for energizing both the start and run windings to initiate motor operation and switch means for de-energizing the start winding and locking in the run

winding when the motor comes up to speed, the switch means being arranged to lock out the drive motor upon the subsequent opening of the door switch, whereby said start switch must be again operated to restart the motor, the improvement comprising an electrically operated door latch means in parallel circuit with the drive motor run winding and resilient means interposed between the door and the cabinet for biasing said door toward its open position, said door latch means being arranged to urge the door to its closed position against the bias



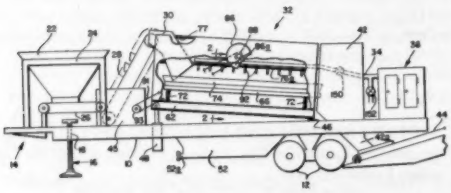
of said resilient means and to lock the door in its closed position when the run winding is energized and to unlock the door when the run winding is de-energized, said resilient means automatically urging said door toward its open position when the door is unlocked, so that when starting the appliance said door must be held closed manually to overcome said resilient means and simultaneously said start switch must be closed to simultaneously actuate the door latch means and energize the motor run winding.

4,132,010

MOBILE SAND DE-OILING APPARATUS

Robert E. Deland, Taunton, Mass., assignor to Costal Services, Inc., Braintree, Mass.

Filed Jul. 25, 1977, Ser. No. 818,877
Int. Cl.[2] B08B *3/00, 3/10*
U.S. Cl. 34—60 **8 Claims**



1. Apparatus for cleaning oil from sand comprising

A. an elongated perforate tray having an entrance end and an exit end,

B. means for adjustably inclining the tray so that its entrance end is as high or higher than its exit end,

C. means for depositing oil-contaminated sand on the entrance end of said tray,

D. means for vibrating the tray so that the sand deposited thereon is transported along said tray toward its exit end,

E. means disposed above the tray for directing a multiplicity of high velocity steam jets against the upper surface of the tray over substantially its entire area so that any oil contaminating the sand on the tray is heated, made flowable and is driven by the steam jets from the sand particles through the tray as the sand particles proceed along the tray, and

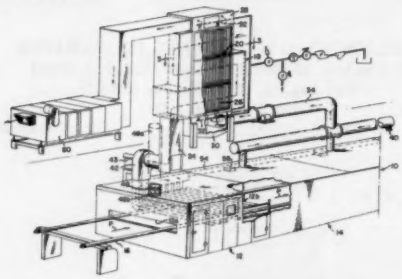
F. means located below the tray for collecting the oil contaminant and steam condensate the drips through the tray.

4,132,011

WASTE HEAT RECYCLING SYSTEM

John A. Nichols, Stoughton, Mass., assignor to Airtech Systems, Inc., Stoughton, Mass.

Filed Jun. 16, 1976, Ser. No. 696,738
Int. Cl.[2] F26B *13/02*
U.S. Cl. 34—86 **5 Claims**



1. Heat recycling apparatus for hot air dryers of the type having a pre-dryer section followed by a main dryer section each of which comprises a hollow insulated chamber through which product to be dried is carried along a path by a moving conveyor, the improvement comprising:

a chamber for receiving fresh air to be introduced into the dryer, said chamber including baffle means for directing the fresh air from an air inlet to an air outlet through a circuitous multi-pass route within said chamber, a plurality of vertically positioned hot exhaust tubes within said chamber and exposed in said circuitous route, said hot exhaust tubes having inlet and outlet ends, said tube outlet ends being adjacent said fresh air inlet, said vertically positioned hot exhaust tubes including modular sections of tubes each modular section being mounted independent of the next whereby sections can be replaced as modules, said tubes including headers having cleaning spray nozzles directed upwardly and downwardly into said tubes for cleaning the interior of the tubes,

means for forcing the fresh air along said route and into said pre-dryer section for extracting heat from the exhaust gases and increasing the temperature of the pre-dryer section so as to preheat the product to reduce time in the main dryer section,

means for forcing hot exhaust from said main dryer section through said tubes for heating the fresh air prior to entering the pre-dryer section.

4,132,012

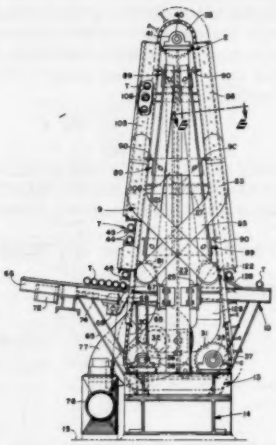
DRYING TOWER FOR THE INNER DIAMETER OF ELONGATED TUBES

Joseph T. Saloom, Youngstown, Ohio, assignor to Wheatland Tube Company, Philadelphia, Pa.

Filed Mar. 30, 1977, Ser. No. 782,761
Int. Cl.[2] F26B *25/00*
U.S. Cl. 34—105 **11 Claims**

1. An apparatus for drying the inside diameter of elongated hollow tubes comprising conveyor means operative to advance tubes carried thereby through at least two drying stages including a plurality of drying stations, and drying means operative to move air through said tubes in one direction at each station of said first stage and subsequently operative to move air through said tubes in an opposite direction at each station of said second stage, said drying means including a first pair of air delivery and return headers for the first drying stage and a second pair of air delivery and return headers for the second drying stage, the air delivery and return headers of

each pair having correspondingly spaced orifices along the lengths thereof to define the drying stations formed by the



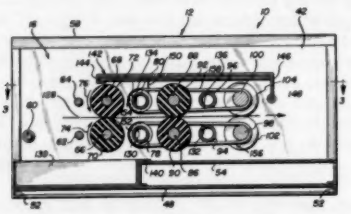
aligned orifice pairs, with such orifice pairs being respectively aligned with at least one of the advancing tubes sequentially positioned therebetween for air movement therethrough.

4,132,013

FILM DRYER

Michael J. Ferrarell, Chicago, Ill., assignor to Buckingham Graphics, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 652,982, Jan. 28, 1976, abandoned. This application Feb. 8, 1977, Ser. No. 757,636
Int. Cl.[2] F26B *13/00*
U.S. Cl. 34—160 **5 Claims**



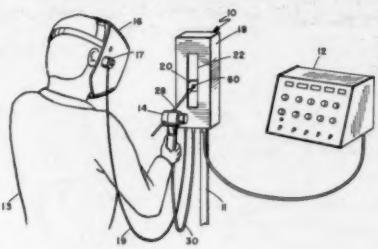
1. A film dryer comprising a housing having an inlet area, including a film inlet opening, at least one pair of squeegee rollers in said inlet area and aligned with said inlet opening for receiving moisture-laden film manually fed into said dryer, a top panel of said housing terminating substantially adjacent said squeegee rollers so as not to obstruct said inlet area, said squeegee rollers being positioned one above the other and in rolling engagement with one another for squeegeeing water from film and having a total vertical height substantially equal to the sum of their diameters, a removable drip tray positioned below said squeegee rollers such that a substantial proportion of the moisture on the film is squeegeed off by the rollers and drips into the drip tray, substantially preventing further moisture from dripping interiorly of said inlet area, said housing having a film outlet opening and air distributing means disposed between said inlet opening and said outlet opening for distributing air within said housing and out through said inlet opening to dry any residual moisture from said film and carry said residual moisture in the direction of said inlet opening to exit said dryer therethrough, said inlet opening having a vertical dimension greater than the vertical height of said squeegee rollers and a horizontal dimension substantially similar to the width of said squeegee rollers to assure said exit of substantially all of said residual moisture therethrough and wherein said air distributing means comprises pairs of air distributing tubes extending from side to side of said housing and having air exit jets directed generally toward the plane of the film passing between said film conveyor rollers and angled back toward said inlet opening to carry moisture toward and out of said inlet opening.

4,132,014

WELDING SIMULATOR SPOT DESIGNATOR SYSTEM

Harvey B. Schow, 2320½ Brant St., San Diego, Calif. 92101

Filed Jun. 20, 1977, Ser. No. 807,892
Int. Cl.[2] G09B *19/24*
U.S. Cl. 35—13 **5 Claims**



1. A spot designator system for a welding training simulator wherein the simulator incorporates a movable target, for providing a visual indication of the spacial relationship between the end of a welding rod and the movable target, said system comprising:

a light source means within said movable target for illuminating a range of welding rod tip spacial orientations,

reflective means on said welding rod for reflecting a portion of said illumination,

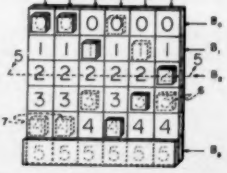
spot designator means comprising a surface adjacent to and surrounding the center of said target for reflecting at least a portion of the illumination from said reflective means and providing visual clues in maintaining the proper spacial relationship between the welding rod and target.

4,132,015

TEACHING-LEARNING AID FOR NUMERATION SYSTEMS AND BASIC COMPUTER CONCEPTS

Lonnie Machen, 6514 McHost Rd., Zachary, La. 70791

Filed Apr. 14, 1977, Ser. No. 787,318
Int. Cl.[2] G09B *19/02*
U.S. Cl. 35—31 F **7 Claims**



1. A mathematical teaching-learning apparatus utilizing cyclic counting to facilitate teaching and learning a wide range of fundamental concepts and skills associated with numeration systems and computers, comprising:

(a) an indicating board having a flat surface with horizontal and vertical columns of spaces drawn thereon with numbers placed in said spaces wherein said numbers beginning with the numeral 0 are consecutively increasing in said

vertical columns and identical in any one of said horizontal columns;

(b) a base board having a width at least that of said horizontal columns and a height of one of said spaces, said base board being placeable on said indicating board to cover up any of said horizontal columns; and

(c) number marker elements no larger than any one of said spaces and placeable on said indicating board.

4,132,016

SHOE, PARTICULARLY FOR GENERAL SPORTING ACTIVITIES AND TRAINING

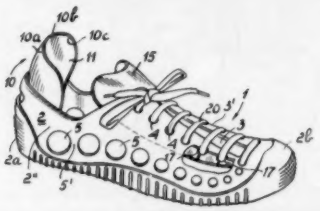
Franco Vaccari, Paleoveneti, 3, Montebelluna (Province of Treviso), Italy

Filed Oct. 25, 1977, Ser. No. 844,780

Claims priority, application Italy, Apr. 8, 1977, 22330 A/77

Int. Cl.[2] A43B *5/00, 3/10, 23/07*

U.S. Cl. 36—114 **10 Claims**



1. A shoe with a sole and an upper portion for general sporting activities and training, comprising a shell made in one piece from wear-resistant material, such as plastics, rubber and the like, and incorporating the sole and the upper portions of the shoe integral therewith, the upper portion having integral therewith an instep, a heel, a toe and two opposite lateral portions thereof and, inside said shell, a liner having the form of a folded elongated strip internally overlying at least the sole portion, the heel and the instep portion and being bent at the toe portion and the heel portion to maintain continuity thereof and protect at least the arch, the toes, the plantar and heel portions of the wearer's foot.

4,132,017

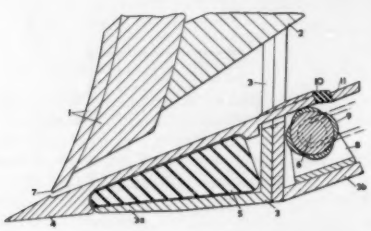
BLADE FOR EARTH MOVING EQUIPMENT

Ernest G. Robson, Christchurch, and George A. M. Smith, Poole, both of England, assignors to National Research Development Corporation, London, England

Filed Aug. 13, 1976, Ser. No. 714,326

Int. Cl.[2] E02F *5/00*

U.S. Cl. 37—141 R **4 Claims**



1. An earth working blade having a leading edge for use on earth moving equipment having at least one strip extending forward of said leading edge of the blade and constituting a plurality of abutting cutters disposed along said leading edge and arranged for oscillation in a pre-determined phase relationship to one another, each cutter being provided with a rearward extension, a frame for securing said blade on a vehcile, and means for mounting each cutter for oscillation about an axis fixed with respect to said leading edge substantially parallel to and close to the said leading edge whereby the cutter penetrates material to be worked by means of spading action, means acting on said rearward extension for oscillating each cutter, a support member secured to said frame, and a resilient cushion bonded to each cutter rearwards of its leading edge and to said support member.

4,132,018

DECORATIVE PLAGUE AND MULTIPLE-PURPOSE HANGER AND STAND THEREFOR

Terence P. Hughes, 3940 Joppa Ave. South, Minneapolis, Minn. 55416

Filed May 4, 1977, Ser. No. 793,526

Int. Cl.[2] G09F *7/18*

U.S. Cl. 40—152.1 **2 Claims**

1. In combination with a decorative frame having an indentation of substantial area penetrating into at least its rear face, dual-purpose mounting means comprising:

a disc having a thickness substantially corresponding to the depth of said indentation into said rear face of said plaque and having a cross-sectional area cooperatively related to the area of said indentation to permit insertion of said disc into said indentation to permit said plaque to be suspended from said disc when said disc is affixed to a wall and wherein the circumference of said disc on a face is provided with at least one projection which, when said face of said disc is affixed to a vertical wall, assures that said frame, when suspended from said disc, is not in contact with said wall in the vicinity of said indentation; and wherein said face of said disc is provided with means for affixing said disc to said wall; and

said disc having one surface interrupted by a transverse slot adapted to receive the lower edge of said frame to support said frame when said disc is placed on a horizontal surface.

4,132,019

POWER OPERATED COPYHOLDER

John F. Wegner, Des Plaines, and Walter Heyek, Chicago, both of Ill., assignors to Edanbob Corporation, Franklin Park, Ill.

Filed Aug. 30, 1976, Ser. No. 718,955

Int. Cl.[2] B41J *11/38*

U.S. Cl. 40—349 **8 Claims**

1. A power operated copyholder comprising

(a) a frame member,

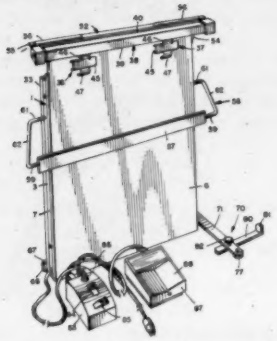
(b) support means for supporting said frame member in a generally upright position,

(c) a face plate slidably mounted on said frame member and adapted to have copy matter supported thereon for viewing and copying by a typist,

(d) means for securing the copy matter on said face plate, including

(1) a pair of spring activated paper holders movable between a copyrelease position and a copy-hold position, and

(2) means mounting said paper holders for movement transversely of said face plate for adjustment to the width of the copy matter,



(e) power means adapted to be controlled by a typist for raising and lowering said face plate with the copy matter thereon, and

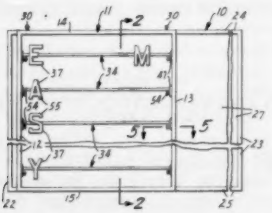
(f) a line guide member mounted on said frame member and extending transversely of said face plate, whereby said line guide member remains stationary while the copy matter is moved with respect thereto.

4,132,020

SIGN STRUCTURE

James G. Nidelkoff, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 3, 1977, Ser. No. 756,092
Int. Cl.[2] G09F *7/08*
U.S. Cl. 40—606 **4 Claims**



2. A sign structure for releaseably mounting slotted display symbols, comprising:

(a) a first frame;

(b) a second frame mounted for movement across the first frame and being of smaller dimension than said first frame in the direction of movement, said second frame comprising at least two pairs of spaced apart parallel elongated frame members, one of said pairs of frame members having a series of apertures spaced along each of the members;

(c) a plurality of parallel elongated retainer bars mounted between the pair of frame members having said apertures, the opposing ends of each of said retainer bars having:

(i) spacer means integral with each end of the retainer bars for slidable movement along the pair of frames having said apertures, and

(ii) spring loaded pin means mounted on said spacer means adapted to be moved with said bars into registry with said apertures and further adapted for engagement and disengagement with said apertures for permitting movement of said retainer bars when disengaged and securing said retainer bars to said pair of frame members when engaged with said apertures, the retainer bars further comprising top and bottom wing members, the top wing member being in L-shaped configuration and having a first edge thereof hinged to a first edge of the bottom wing member by ball and socket means, the wing members having free edges opposite said first edges each free edge having flange means adapted to fit in said slotted display symbols, and

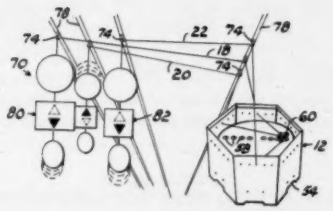
(iii) spring means disposed along said wing members proximate to said flange means to bias said flange means away from each other and against the display symbol slot.

4,132,021

ANIMATED MOTION DISPLAY MACHINE

Thomas L. Byers, 3004 SE. 21, Oklahoma City, Okla. 73115

Filed Jun. 17, 1977, Ser. No. 807,716
Int. Cl.[2] G09F *19/00*
U.S. Cl. 40—614 **4 Claims**



1. An animated display drive, comprising:

an electric motor having a drive shaft;

a housing having an upright wall surrounding said motor in supporting relation,

said wall having a plurality of spaced-apart apertures arranged in a horizontal plane;

crank means within said housing,

said crank means including horizontal disk means having at least one vertical aperture spaced outwardly with respect to the axis of the disk means,

an anchor screw contained by the disk means aperture, and,

a crank pin secured to said anchor screw;

means connecting said drive shaft with said crank means for rotating the latter in the horizontal plane of the wall apertures; and,

at least one flexible element extending, intermediate its ends, through one of the apertures and connected at one end with said crank means and being connected at its other end with a display element to be animated.

4,132,022

REFLECTED SIGN

Charles P. Wood, Jr., 1020 Richwood, Cincinnati, Ohio 45226

Filed Nov. 10, 1976, Ser. No. 740,479
Int. Cl.[2] G09F *7/00*
U.S. Cl. 40—591 **2 Claims**

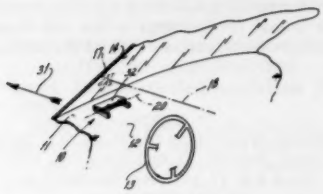
1. A message reminder device for a driver of a vehicle, said device comprising

a windshield and a dashboard, said windshield extending upwardly above said dashboard,

a placard structure having a first placard component adapted to be mounted in a fixed position onto said dashboard and a second placard component movable relative to said first component, said two placard components being pivotable relative one to the other, one of said components including at least one spacer block mounted thereon to maintain a discrete distance between the components when same overlie one another in a storage position, and

message indicia denoted in word form, and in reverse image

form, on one side of at least one of said fixed and movable components, the mounted location of said placard structure on said dashboard permitting said message indicia to be reflected upwardly into said windshield for easy viewing and reading by the driver of that vehicle in which said device is mounted,



said movable placard component being movable between a reminder position in which said message indicia can be reflected onto said windshield to present same in readable form, and a storage position in which said message is not reflected onto said windshield.

4,132,023

SELF-LOADING PISTOL

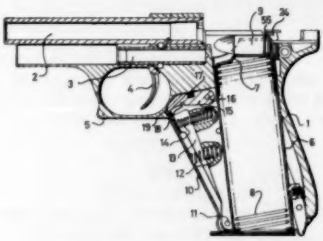
Helmut Weldle, Beffendorf, Germany, assignor to Heckler & Koch GmbH, Oberndorf, Germany

Filed May 19, 1977, Ser. No. 798,660

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1976, 2627641

Int. Cl.[2] F41C *19/14*

U.S. Cl. 42—7 **14 Claims**



1. A self-loading pistol having a barrel and a grip containing a magazine, a breech block slidable in the longitudinal direction of said barrel, a firing pin slidable in said breech block, energy accumulator means in said breech block to actuate said firing pin, means including a cocking lever to cock and load said accumulator means, stop means to hold said accumulator means in loaded position when said cocking lever is slightly released, trigger means to remove said stop means to permit said accumulator means to unload and act on said firing pin and means to automatically remove said stop means and in turn said cocking means upon complete release of said cocking lever prior to actuation of said trigger means after cocking to unload said accumulator means.

4,132,024

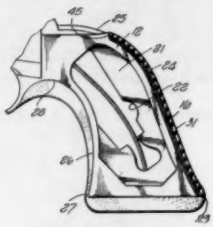
CUSHIONED PISTOL GRIP

Frank A. Pachmayr, Los Angeles, and Jack R. Farrar, Whittier, both of Calif., assignors to Packmayr Gun Works, Inc., Los Angeles, Calif.

Filed Oct. 3, 1977, Ser. No. 838,805

Int. Cl.[2] F41C *23/00*

U.S. Cl. 42—71 P **18 Claims**



1. A pistol grip comprising:

a body to be received about a pistol handle;

said body including two opposite side portions adapted to be received at opposite sides respectively of the pistol handle, and a rear cross strap portion secured permanently to and connecting together said two opposite side portions at rear edges thereof and adapted to extend across the back of the pistol handle;

said body forming at least one forward flange carried by one of said side portions of the body at a forward edge thereof and projecting laterally inwardly at a location to be received in front of the pistol handle;

said body being flexible in the vicinity of said rear cross strap portion to enable movement of said flange laterally with said one side portion relative to the other side portion during application of the body to the pistol handle;

said side portions and said rear cross strap portion and said forward flange all being molded at least in part of elastomeric material to cushion contact thereof with a user's hand.

4,132,025

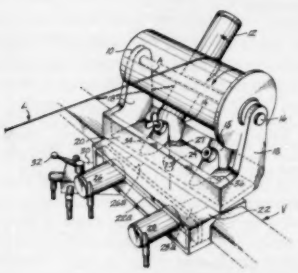
GANGION ENWRAPMENT CONTROL APPARATUS FOR LONG LINE HAULERS

Kenneth F. Tison, Federal Way, Wash., assignor to Marine Construction & Design Co., Seattle, Wash.

Filed Jul. 8, 1977, Ser. No. 813,819

Int. Cl.[2] A01K *91/00*

U.S. Cl. 43—4 **7 Claims**



1. In combination with apparatus for hauling of long lines aboard a fishing vessel, operatively associated line guide means interposed to engage the line being hauled including a guide roller, vessel-mounted support means for the guide roller rotatively supporting the roller to form a roller bearing, said roller

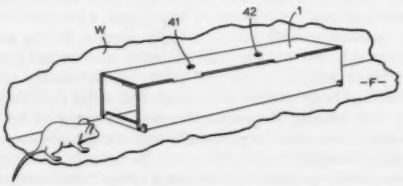
bearing having a substantially cylindrical line-engaging portion over which the ground line runs during hauling and that deflects the ground line in a plane defined by the line stretches respectively approaching and departing from said roller, said support means maintaining said guide roller with its rotational axis oriented generally at right angles to said plane and being angularly adjustable on the vessel to vary the angular orientation of said axis in relation to said plane, and control means connected to said support means and selectively operable during line hauling to adjustively vary the angular orientation of said guide roller axis in relation to said plane as a means to vary the twisting of said ground line by said guide roller.

4,132,026

SIMPLIFIED BLANK FORMING A RODENT POISON CONTAINER

Rand E. Dodds, Portage, Mich., assignor to J. J. Dill Company, Kalamazoo, Mich.

Filed Apr. 25, 1977, Ser. No. 790,237
Int. Cl.[2] A01M *1/20*
U.S. Cl. 43—131 **3 Claims**



1. In a device positionable in a runway for exposing pests to a poisonous material, comprising:

a horizontally elongated tubular member of rectangular cross section, said tubular member including opposed top and bottom walls joined together by opposed side walls;

said tubular member being formed from a single, substantially rectangular sheet of bendable material;

one of said side walls and one of said top and bottom walls, adjacent the opposite side edges of the sheet, having cooperating slot and tab means for interlocking said walls together to hold said sheet in a bent for wherein it defines said tubular member;

a low upright barrier wall fixed to said tubular member adjacent each end thereof, said low barrier wall being substantially rectangular and extending across the complete width of said tubular member, the opposite ends of said tubular member being substantially open except for said low barrier walls to thereby form a substantially closed tray for retaining poisonous material;

said barrier wall being integral with said bottom wall and bent upwardly therefrom in substantially perpendicular relationship thereto, said bottom wall having a horizontal longitudinal length which is less than the horizontal longitudinal length of the adjacent side walls, said bottom wall having its end edges spaced inwardly from the adjacent end edges of the side walls by a distance equal to the height of said barrier wall;

said barrier wall having a horizontal width which is greater than the width of said bottom wall, said barrier wall having integral locking tabs projecting outwardly from the opposite ends thereof, said tabs projecting sidewardly of said tubular member outwardly beyond said side walls; and

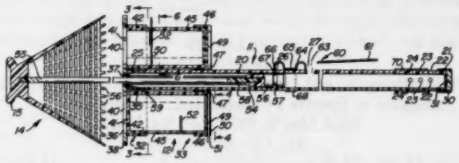
said side walls, adjacent the lower corners thereof, having cut means for receiving therein one of said locking tabs to interlock the barrier wall to said side walls and rigidify said tubular member.

4,132,027

INSECT CAPTURING DEVICE

Joseph J. Malacheski, 28 E. Division St., and Richard J. Zenda, 21 O'Neill Ave., both of Wilkes-Barre, Pa. 18702

Filed May 27, 1977, Ser. No. 801,107
Int. Cl.[2] A01M *3/00, 5/02*
U.S. Cl. 43—134 **13 Claims**



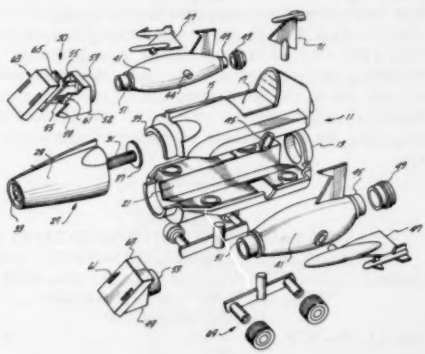
1. An insect capturing device comprising a handle, a receiver carried by said handle and having an outwardly facing opening, a catcher carried by said handle outwardly of said receiver and facing inwardly toward said receiver, mounting means mounting said catcher for movement inwardly toward and outwardly away from said receiver to transport an insect toward and into said receiver, resilient means urging said catcher inwardly toward said receiver, and releasable detent means for holding said catcher away from and releasing said catcher for movement inwardly toward said receiver.

4,132,028

RECONFIGURABLE TOY WITH OPTICAL ELEMENTS

Iwakichi Ogawa, Kashiwa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan

Filed May 20, 1977, Ser. No. 798,838
Int. Cl.[2] A63H *33/06*
U.S. Cl. 46—17 **11 Claims**



1. A toy comprising:

a rocket body member having an exhaust opening;

nose means for attachment to said body member;

rotatable means configured to represent an antenna at the exterior of said nose means and having a decorative surface visible through the exhaust opening;

first and second engine pod means for removable attachment to the respective sides of said body member, each said pod means having first and second press-fit rims;

reflective means mounted within the body member to translate an image of the decorative surface to the exhaust opening;

first and second hood means containing the optical elements for press-fit attachment to said first and second press-fit rims;

engine muffler means for attachment to said first and second press-fit rims;

a landing gear assembly mounted to the underside of said body member;

horizontal stabilizer assembly mounted to said body; and

first and second wing tip means for removable attachment to each of said engine pods respectively, whereby rotation of the rotatable antenna means will provide a rotatable multiple image visible at the exhaust opening.

4,132,029

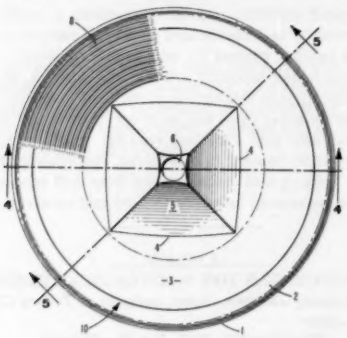
PYRAMID FLYER

Scott Thompson, and James T. Chidester, both of Denver, Colo., assignors to Positive Pyramids, Inc., Denver, Colo.

Filed May 9, 1977, Ser. No. 794,912

Int. Cl.² A63H *27/00*

U.S. Cl. 46—74 D **12 Claims**



1. An aerodynamic toy for being thrown through the air in a spinning motion comprising a substantially planar circular base having a vertical axis perpendicular to said circular base and extending through the geometric center of said circular base, a rim attached to the perimeter of said circular base for stabilizing the movement of said circular base about said vertical axis due to the spinning motion of said rim, a centrally located pyramid structure attached to said circular base for enhancing the aerodynamic properties of said aerodynamic toy.

4,132,030

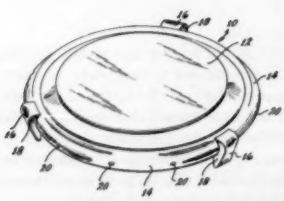
FLYING SAUCER TOY WITH SELECTIVELY POSITIONABLE FINGER GRIP SUPPORT LEGS

James A. Lehman, 314 Wisconsin Ave., El Cajon, Calif. 92020

Filed Aug. 1, 1977, Ser. No. 820,429

Int. Cl.² A63H *27/00*

U.S. Cl. 46—74 D **8 Claims**



1. A hand tossed flying saucer toy comprising:

a saucer-like body with a peripheral depending lip;

a plurality of protruding finger grips removably attached to the exterior surface of said depending lip, said finger grips are selectively positionable as desired for effecting the flight characteristics of said flying saucer toy; and

attachment means for removably attaching said finger grips to said exterior surface of said depending lip in their selected positions.

4,132,031

AERODYNAMIC TOY WITH RADIAL ELEVATIONS ON ITS CONVEX SIDE

Louis G. Psyras, 295 Commonwealth Ave., Boston, Mass. 02116

Filed May 5, 1977, Ser. No. 793,923

Int. Cl.² A63H *33/26, 1/32*

U.S. Cl. 46—228 **14 Claims**

1. An aerodynamic toy comprising a rotatable free flight body of generally circular configuration and having a convex upper surface and a concave bottom surface comprising a geometrically centrally disposed cylindrical shaped first body portion of predetermined uniform length having an upper end and a lower end, a flat surface integral with and enclosing the cylindrical body portion at its upper end, a second body portion concentric with said first body portion having an upper convex side and a lower concave side, said second body portion being integral with and extending outwardly from the cylindrical body portion at its open end, a rim portion integral with and defining the circumferential perimeter of the second body portion, said rim portion having the shape of a parabola forming a smooth curve with and being an extension of the second body portion and opening toward the center of the aerodynamic toy, and a plurality of elevations extending rectilinearly along said upper convex side and radially outwardly from the said first body portion to points adjacent said rim and being integral with said second body portion.

4,132,032

TOY WITH MOVABLE MOUTH

Matej K. Triska, 2265 N. Elizabeth, Indianapolis, Ind. 46219

Filed May 19, 1977, Ser. No. 798,427

Int. Cl.² A63H *3/20, 33/26*

U.S. Cl. 46—237 **4 Claims**

1. A toy comprising in combination, a rubberlike creature facsimile having a movable resilient mouth member in a residual memory position partly open and with jaws separable by force,

a magnet with longitudinally spaced magnetic poles affixed to the upper jaw of said movable mouth member inside said creature facsimile to tend to close the mouth by weight of the magnet and with one pole disposed inwardly and the other outwardly,

and a wand member including a second magnet with longitudinally spaced magnetic poles arranged in a sense with a pole at the end of the wand member of the same polarity of said outwardly disposed pole of the first magnet,

whereby when by movement of said magnet on said wand member it approaches the mouth member the poles of the

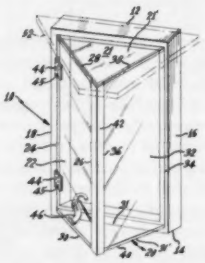
two magnets repel to move the jaws of said mouth member open without engagement with said wand, and upon further movement of said wand member into the vicinity of said open mouth the inwardly disposed pole of opposite polarity said magnet in the upper jaw of said mouth member engages said wand in a biting like action with the weight of both engaged magnets then fully closing said jaws on said wand.

4,132,033

VARIABLE ALIGNMENT WINDOW ASSEMBLY

John D. Esposito, 7048 Ramoth Dr., Jacksonville, Fla. 32226

Filed Sep. 16, 1977, Ser. No. 833,734
Int. Cl.[2] E06B *7/28*
U.S. Cl. 49—71 **17 Claims**



1. A variable alignment window assembly for mounting in a window frame of an enclosure, said window frame having a first vertical lateral side, a top and a bottom, said assembly comprising:

a. an inner window panel having an inner vertical side, an apical vertical side, a top side and a bottom side; and

b. an outer window panel having an outer vertical side, an apical vertical side, a top side and a bottom side;

c. means for rigidly angularly mounting said inner window panel to said outer window panel along the respective apical vertical sides of said panels such that said apical vertical sides of said panels are co-extensive and are held exteriorly of said window frame at an angle between said panels of from about 1° to about 179°; and

d. means for pivotally mounting said first window unit to said window frame, said means being attachable to said inner window panel adjacent said inner vertical side thereof and to said window frame adjacent said first vertical lateral side thereof; so constructed and arranged that said assembly is pivotally mounted to said window frame adjacent a first vertical lateral side thereof and pivotable between a closed position in which said inner vertical side is co-extensive, and in sealing contact, with said first vertical lateral side of said window frame and in which said outer vertical side is co-extensive, and in sealing contact, with the second vertical lateral side of said window frame and an open position in which said outer vertical side is outwardly remote from said second vertical lateral side of said window frame.

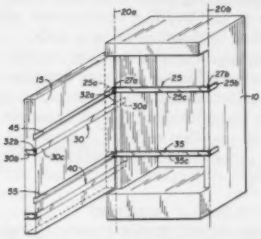
4,132,034

REFRIGERATOR DOOR WITH DOUBLE ACTING HINGE

William C. Van Siclen, 546-A Miner Rd., Orinda, Calif. 94563

Filed Oct. 25, 1977, Ser. No. 844,568
Int. Cl.[2] E05D *15/50*
U.S. Cl. 49—382 **10 Claims**

1. In a door assembly consisting of a frame defining an opening having first and second sides, a door having first and second edges corresponding to said first and second sides, said door being capable of assuming a closed position wherein said door blocks said opening, the means allowing said door to assume in addition to said closed position two open positions, one from each of said sides, the improvement comprising: at least one pair of hinge straps mounting said door to said frame, each of said straps having a central portion of a length substantially equal to the distance between said first and second sides of said frame, and first and second end segments hingedly fastened to said central portion, said central portions extending across said opening when said door is in its closed position; means for rigidly fastening said first end segment of said first strap to said first side of said frame, means for rigidly fastening said second end segment of said first strap to said second edge



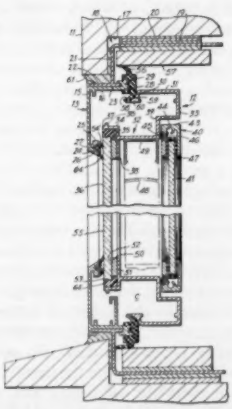
of said door; means for rigidly fastening said first end segment of said second strap to said first edge of said door; and means for rigidly fastening said second end segment of said second strap to said second side of said frame, whereby said first strap central segment extends across said opening and said second strap central segment extends across said door when said door is opened from said first side, and whereby said first strap central segment extends across said door and said second strap central segment extends across said opening when said door is opened from said second side.

4,132,035

INSULATED WINDOW ASSEMBLY

Henry R. Frambach, Allendale, N.J., assignor to Samson Industries, Inc., Glen Cove, N.Y.

Filed Nov. 14, 1977, Ser. No. 850,942
Int. Cl.[2] E06B *7/16*
U.S. Cl. 49—484 **4 Claims**



1. A window construction for installation in the window receiving opening of a building comprising, in combination an outer fixed frame member, means mounting said fixed frame member in said opening, an inwardly extending leg portion on said fixed frame member, and a sash frame member having a leg portion movably mounted to said fixed frame member, said sash frame member carrying an inner and outer glass lite, glazing means interposed between and connecting said sash

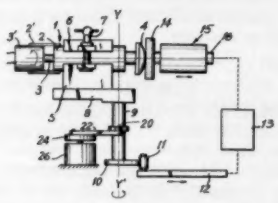
frame member and the periphery of said lites defining a sealed connection between said lites and said sash frame member, a continuous laterally inwardly extending flange formed on said outer fixed frame member overlapping the outermost face of said lites adjacent the periphery thereof, a first resilient, deflectible, continuous perimetric gasket member carried by said flange portion and forming, in the closed position of said window, a continuous seal area with the outer face of said outer lite in laterally inwardly spaced relation to said glazing means, a second resilient, deflectible, continuous perimetric gasket member interposed between said frame members abutting said inwardly extending leg portion on said fixed frame member and a portion of said building opening and abutting said sash frame leg portion in closed position to define a continuous seal area therebetween in spaced relation to said first seal area, whereby there is defined in the area bounded by said frames and gaskets a substantially sealed surrounding chamber, said glazing means being shielded against exposure to the exterior environment by said first resilient deflectible continuous perimetric gasket in the closed position of said window.

4,132,036

ADJUSTING STRUCTURE IN AN ASPHERIC LENS GRINDING APPARATUS

Yuzuru Doi, Niiza; Masanao Kawahara, Tsurugashima, and Yasuyuki Tejima, Tokyo, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Japan

Filed Oct. 12, 1977, Ser. No. 841,596
Claims priority, application Japan, Oct. 15, 1976, 51-122898
Int. Cl.[2] B24B *13/00*
U.S. Cl. 51—124 L **8 Claims**



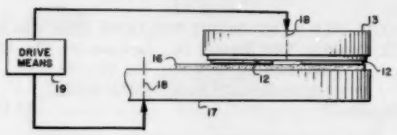
1. In a lens grinding apparatus which is particularly suited for grinding aspheric lenses and which includes an oscillating means for angularly oscillating about a given oscillating axis a template which determines the curvature of the ground surface of a lens, a rotary shaft means for carrying and rotating a lens which is to be ground and having a shaft axis perpendicular to the oscillating axis, a rotary grinding means for placing a grinding wheel in engagement with the lens surface which is to be ground and having a grinding axis parallel to the shaft axis, a tracing means for engaging the template and tracing the oscillatory movement thereof, a transmission means connected between the tracing means and grinding means for moving the grinding means along said grinding axis in response to movement of the tracing means by template with the movement of the grinding means along its axis having a given fractional relationship with respect to the extent of movement of the tracing means by the template, a support means supporting the shaft means for rotation about said shaft axis, and a mounting means mounting the support means on the oscillating means for movement therewith about the oscillating axis, so that while the lens which is to be ground is rotated about the shaft axis and engaged by the grinding wheel of the grinding means it is simultaneously oscillated about the oscillating axis, the improvement wherein the support means has a support axis parallel to but spaced from the shaft axis while the mounting means mounts the support means for adjustable turning movement about its support axis so that by turning the support means about its support axis with respect to said mounting means the shaft axis can be adjusted so as to have a location intersecting the oscillating axis.

4,132,037

APPARATUS FOR POLISHING SEMICONDUCTOR WAFERS

Anthony C. Bonora, Atherton, Calif., assignor to Siltec Corporation, Menlo Park, Calif.

Filed Feb. 28, 1977, Ser. No. 772,749
Int. Cl.[2] B24B *37/04*
U.S. Cl. 51—131 C **13 Claims**



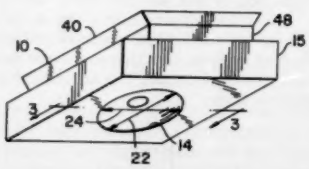
1. In polishing apparatus having a backing plate on which a thin generally flat wafer is to be mounted with a first side surface thereof exposed to be polished, a polishing pad to engage said first side surface of said wafer with a polishing pressure applied essentially uniformly over the area of said surface, and drive means to cause relative lateral motion between said polishing pad and said first side surface to polish the latter; the improvement to the combination comprising a sheet of a wafer mounting material on said backing plate having a generally flat exposed surface provided by an impervious polymeric material exhibiting direct solid-to-solid wetting characteristics at said exposed surface with the material of said wafer to provide an intimate dry cohesive bond at the interface of a second side surface of a wafer and said polymeric material resistant to tensile separation forces and having sufficiently high static resistance to shear forces to prevent slippage of said wafer on said polymeric material from being caused by the passage of said polishing pad laterally across said wafer first side surface during polishing thereof, said sheet of wafer mounting material being volume compressible to absorb without deforming said wafer any asperities at said second side of said wafer or in the thickness thereof upon said uniform application of polishing pressure.

4,132,038

CUTTING MASTER AND METHOD OF MAKING CUTTING MASTER FOR EROSION MACHINING

Thomas J. O'Connor, Ann Arbor, Mich., assignor to Easco-Sparcatron, Inc., Ann Arbor, Mich.

Continuation of Ser. No. 612,894, Sep. 12, 1975, abandoned. This application Feb. 18, 1977, Ser. No. 770,243
Int. Cl.[2] B24D *5/00*
U.S. Cl. 51—204 **4 Claims**

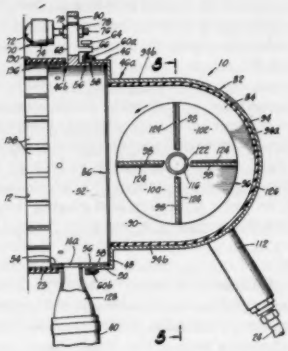


1. A cutting master for total form abrasion machining of a predetermined form in carbon or the like comprising a body portion having a surface which is substantially the mirror image shape of the form to be abrasion machined and different in size therefrom in at least two mutually perpendicular dimensions by a predeterminded amount, which surface includes a flat portion at the center thereof that extends in the two mutually perpendicular dimensions substantially the same distance the abrasive surface of the cutting master is different in size from the form to be machined and which surface is abrasive.

4,132,039
ABRASIVE BLASTING APPARATUS

Neal J. Gilbert, Highland, and Edward L. Horton, El Monte, both of Calif., assignors to Enviro-Blast International, Los Angeles, Calif.

Filed Feb. 10, 1977, Ser. No. 767,348
Int. Cl.[2] B24C 3/06
U.S. Cl. 51—424 **11 Claims**



1. Portable apparatus for blasting a surface with an abrasive material, comprising:

(a) a two-section housing in which one of the sections communicates with the other section through an elongate rectangular opening in a separating wall between the sections, said other section having a circular side opening with a perimeter outwardly spaced around said rectangular opening, and both of said openings being in facing relation to said surface;

(b) projecting means within said one section of the housing for propelling a particulate abrasive through said rectangular opening to form a transversely elongated stream of particulate abrasive material within the other section for engagement with said surface through said circular opening;

(c) resilient sealing means supported on said other section surrounding said circular opening and being adapted to contact the surface to establish a sealed relationship between the surface and said housing;

(d) means for supplying a particulate abrasive material to said projecting means;

(e) means to collect propelled abrasive material from within said other section; and

(f) means for adjustably varying the orientation of said transversely elongated stream in a circumferential direction within said circular opening.

4,132,040
MULTI-SECTION LIFTING BOOM

John L. Grove, Greencastle, Pa., assignor to JLG Industries, Inc., McConnellsburg, Pa.

Filed May 12, 1977, Ser. No. 796,381
Int. Cl.[2] B66C 23/04
U.S. Cl. 52—115 **31 Claims**

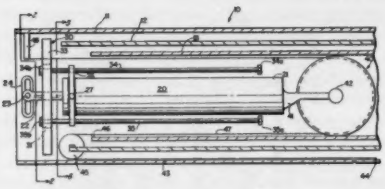
1. A multi-section lifting boom for cranes or the like comprising:

base, mid and fly sections in telescopic relation, a hydraulic ram having a cylinder and piston rod, means connecting the free end of the piston rod to the rear of the boom base section for movement transversely of the boom axis,

means connecting the ram cylinder to the boom mid section for movement of at least part of said ram relative thereto,

chain means for extending and retracting the boom fly section upon extension and retraction of said hydraulic ram, and

a combined sprocket and roller rotatably supported from the forward end of the hydraulic ram, said chain means trained over said sprocket of said sprocket and roller, and

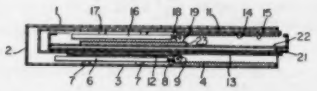


said sprocket and roller being in rolling contact with the said fly section.

4,132,041
TELESCOPIC APPARATUS

Bernardus C. Van den Broek, Juliana van Stolbergstraat 7, Weert, Netherlands

Filed Oct. 27, 1977, Ser. No. 845,916
Claims priority, application United Kingdom, Nov. 8, 1976, 46435/76
Int. Cl.[2] E04H 12/34
U.S. Cl. 52—118 **6 Claims**



1. A telescopic boom assembly including a first boom member,

a second boom member telescoping within said first boom member,

said boom assembly having a retracted position wth said second boom member telescoped within said first boom member and an extended position with said second boom member extended from said first boom member,

a first rack fixed onto said first boom member adjacent one end thereof and extending toward the middle thereof,

a second rack fixed onto said second boom member,

the beginning of said second rack being adjacent to the end of said first rack when said second boom member is in the retracted position,

a first cylinder fixed into said first boom member,

a piston within the cylinder,

a piston rod attached to the piston and extending from the cylinder,

a rotatable pinion wheel attached to the piston rod, and

said rotatable pinion wheel meshing with both said first and second racks and said first and second racks being positioned so that when said piston rod is moved from a retracted to an extended position, said pinion wheel moves along said first rack and forces said second rack outward to cause said second boom member to move to the extended position.

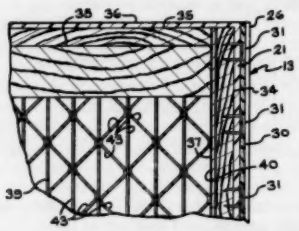
4,132,042
DOOR STRUCTURE AND METHOD FOR FORMING SUCH STRUCTURE

Vincent Di Maio, 4037 Lancelot Rd., Toledo, Ohio 43623

Filed Jan. 13, 1978, Ser. No. 869,384
Int. Cl.[2] E04B 2/28; E04C 2/32
U.S. Cl. 52—309.1 **15 Claims**

1. An improved flat rectangular door panel having two side surfaces, two long edge surfaces and two short edge surfaces comprising a flat rectangular honeycomb core having two long edges and two short edges, two flat steel strips extending

perpendicular to said side surfaces, one of said strips abutting each long edge on said core, a wood frame enclosing said core, said wood frame abutting said steel strips and said short core



edges, and a molded synthetic resinous material defining said panel surfaces and bonded to said wood frame, said steel strips and said honeycomb core, said molded synthetic resinous material stressing said steel strips.

4,132,043

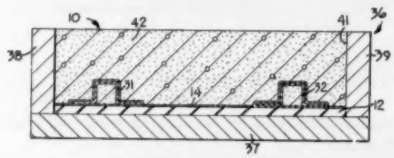
STRUCTURAL UNITS

Bernard T. Juba, White Bear Lake, Minn., assignor to H. B. Fuller Company, St. Paul, Minn.

Filed Feb. 22, 1977, Ser. No. 770,634

Int. Cl.[2] E04C *2/26*

U.S. Cl. 52—309.17 **9 Claims**



7. A composite structural unit comprising plastic resinous sheet means, concrete sub-unit means, and a polychloroprene contact adhesive, said contact adhesive providing a bond between said sheet and said concrete, said plastic sheet having been coated on one side with said contact adhesive and said coated sheet and said concrete having been brought together after said adhesive was dry to the touch but while said concrete was still in a wet pourable uncured condition.

4,132,044

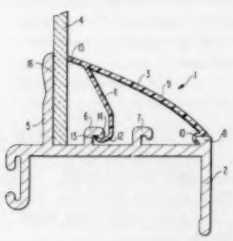
HIGH-STRENGTH WINDOW ASSEMBLY

James H. Rollyson, Ocean Ridge, Fla., assignor to Rollyson Aluminum Products, Inc., Ironton, Ohio

Filed Dec. 27, 1976, Ser. No. 754,317

Int. Cl.[2] E06B *3/54*

U.S. Cl. 52—775 **4 Claims**



1. A window assembly comprising a window pane and a frame assembly generally surrounding said pane, said window assembly capable of resisting high wind loads, even up to the breaking point of the pane, yet permitting easy installation and removal of said pane in said frame assembly, said frame assembly comprising a frame and a removable glazing member, said frame in cross-section comprising an interior side and opposite, exterior side, and an inner side and an opposite, outer side, the plane of the exterior sides and the interior sides being generally parallel to the plane of said pane, said frame provided with an inwardly extending first molding on the exterior side thereof, an inwardly extending second molding on the opposite side of said frame, a flange extending between said first and second moldings, and hook engaging means located generally between the pane and the second molding and inward of said flange, said hook engaging means having a hook-shaped portion generally facing outward and opening away from said pane, said hook-shaped portion having a first portion thereof extending in a generally inner direction, a second portion thereof connected to the first portion and extending in an interior direction, and a third portion thereof connected to the second portion and extending in an outer direction, said glazing member comprising a retaining flange means at one edge thereof engaging said second molding, a glazing bead on the opposite side of said glazing member from said retaining flange means, and a hook-shaped flange means extending generally outwardly of said glazing member from a location between said glazing bead and said retaining flange means in position to hookedly interengage said hook engaging means, the hook-shaped portion of said hook-shaped flange means generally facing inward and opening towards said pane, said pane located between, and retained in said frame by, said first molding and said glazing bead, said hook-shaped flange means and said hook engaging means cooperating so that said glazing bead is insertable in and removable from said frame without damage thereto, and when said pane is under substantially no load said hook-shaped flange means and said hook engaging means are not interengaged but when load is applied to the exterior of said pane, said glazing member rotates inwardly away from said flange about said second molding to place said hook-shaped flange means in hooked interengagement with said hook engaging means, said hooked flange means and said hook engaging means cooperating when in hooked interengagement to substantially prevent further rotational movement of said glazing member away from said flange about said second molding.

4,132,045

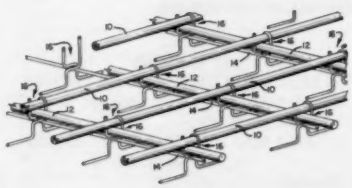
REINFORCING BAR SUPPORT

Ralph G. Sullivan, Birmingham, Ala., assignor to The Dayton Sure-Grip & Shore Company, Miamisburg, Ohio

Filed Oct. 27, 1977, Ser. No. 845,902

Int. Cl.[2] E04C *5/16*

U.S. Cl. 52—685 **4 Claims**



1. A bar support for supporting a plurality of longitudinally extending reinforcing bars and a transversely extending reinforcing bar such that said reinforcing bars are held in proper spaced relationship, comprising:

a cross rod formed of wire stock, positionable beneath said transversely extending reinforcing bar and extending along said bar in parallel relationship,

a plurality of bar support chair means, laterally spaced along said cross rod, for engaging said longitudinally extending reinforcing bars and said transversely extending reinforcing bar, each of said bar support chair means including:

a first chair member formed of wire stock having a first vertical leg portion extending above and laterally displaced from said cross rod, a horizontally extending portion welded to said cross rod, and a downwardly extending support portion, and a second chair member formed of wire stock having a second vertical leg portion extending above and laterally displaced from said cross rod on the opposite side of said cross rod from said first leg portion, a horizontally extending portion welded to said cross rod at a point adjacent that at which said first chair member is attached to said cross rod but spaced therefrom by a distance greater than the diameter of a longitudinally extending reinforcing bar, and a downwardly extending support portion,

whereby the longitudinally extending reinforcing bars may be held between said leg portions transversely to said cross rod, and said transversely extending reinforcing bar may be held between said leg portions parallel to said cross rod.

4,132,046

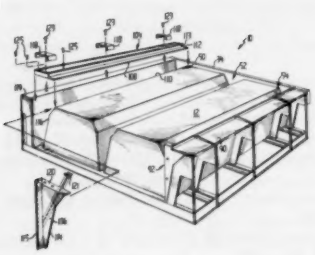
METHOD OF MAKING MODULAR CRYPTS

Edward C. Duwe, 3840 Highland Shores, Oshkosh, Wis. 54901, and William E. Duwe, 1203 Washington Ave., Oshkosh, Wis. 54901

Division of Ser. No. 622,060, Oct. 14, 1975, Pat. No. 4,033,545, which is a continuation-in-part of Ser. No. 514,932, Oct. 15, 1974, Pat. No. 3,938,773. This application Mar. 22, 1977, Ser. No. 780,230

Int. Cl.[2] E04B *1/04;* **E02D** *35/00*

U.S. Cl. 52—745 **3 Claims**



1. A method of casting differently configured concrete crypt modules which interlock with one another when assembled in a modular mausoleum crypt structure, comprising the steps of:

providing a universal casting apparatus having a configured casting cavity for receiving a fluent casting material, said casting cavity including at least three spaced, substantially vertical elongate sidewall cavities having ends, closures arranged at the ends of the sidewall cavities, said casting cavity having an upper perimetrical edge defining an upper casting plane;

altering the configuration of the casting cavity to a first predetermined shape by rigidly securing selected ones of a plurality of removable inserts to said casting apparatus at predetermined locations thereon for forming a first crypt module having first interlocking elements and at least two sidewalls;

introducing the fluent casting material into the altered casting cavity substantially up to the upper casting plane thereof;

after introducing the fluent casting material into the cavity, locating at least two removable strip inserts onto the fluent casting material and across said casting cavity below said upper casting plane and in parallel, lengthwise alignment with predetermined ones of said sidewall cavities to form longitudinal grooves in the top surface of the crypt module being cast;

providing lifting holes in the top surface of the casting material of the first crypt module;

removing the first crypt module from the casting cavity after said casting material has at least partially set by removing the closures from the ends of the sidewall cavities, inserting pins into said lifting holes and hoisting said first crypt module from the casting cavity;

altering the configuration of the casting cavity to a second predetermined shape by rigidly securing selected one of a plurality of removable inserts to said casting apparatus at predetermined locations thereon to form a second crypt module having at least two sidewalls and second interlocking elements which interlock with the first interlocking elements of the first crypt module;

introducing the fluent casting material into the altered casting cavity substantially up to the upper casting plane thereof;

after introducing the fluent casting material into the cavity, locating at least two removable strip inserts onto the fluent casting material and across said casting cavity below said upper casting plane and in parallel, lengthwise alignment with predetermined ones of said sidewall cavities to form longitudinal grooves in the top surface of the crypt module being cast;

providing lifting holes in the top surface of the casting material of the first crypt module;

removing the second crypt module from the casting cavity after said casting material has at least partially set by removing the closures from the ends of the sidewall cavities, inserting pins into said lifting holes and hoisting said second crypt module from the casting cavity.

4,132,047

METHOD OF MAKING SHEATHED TUBULAR STICK

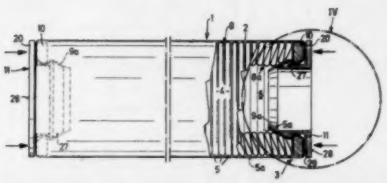
Günter Gerigk, Oberursel; Klaus-Jürgen Bittner, and Armin Köstner, both of Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 730,753, Oct. 7, 1976, Pat. No. 4,064,673, which is a division of Ser. No. 586,224, Jun. 12, 1975, Pat. No. 4,013,099. This application Aug. 12, 1977, Ser. No. 824,196

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1975, 2510637

Int. Cl.[2] B65B *5/00*

U.S. Cl. 53—396 **5 Claims**



1. A process for the production of a sheathed, hollow, cylindrical stick composed of a flexible tube folded by longitudinal shirring, which comprises inserting a stick composed of a longitudinally folded tube into a section of a jacket of sufficient length that it projects over both ends of said stick,

inserting annular discs inside said jacket adjacent each front wall of said stick,

inverting said projecting portions of said jacket inwardly over the surfaces of said annular discs,

and inserting clamping elements into the covered openings in said annular discs.

4,132,048

VACUUM PACKAGING BULK COMMODITIES

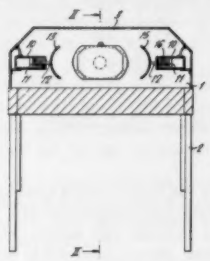
Timothy T. Day, 197 Vallance Rd., Bethnal Green, London, England

Filed Mar. 28, 1977, Ser. No. 782,087

Claims priority, application United Kingdom, Mar. 29, 1976, 12594/76

Int. Cl.[2] B65B *31/02, 53/02*

U.S. Cl. 53—434 8 Claims



1. A process of packing a bulk commodity comprising vacuum packaging and sealing the commodity into a bag of plastics material, enclosing the loaded vacuum packaged and sealed bag within a chamber, reducing the pressure in the chamber sufficient to cause the sealed bag to expand toward a heating means to heat the sealed bag to a softened condition under the reduced pressure, and returning the interior of the chamber to atmospheric pressure to cause the heated sealed bag in softened condition to closely envelope the commodity in intimate surface contact therewith.

4,132,049

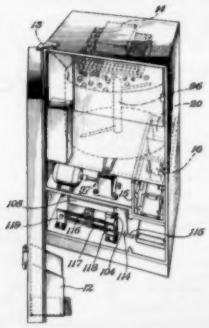
METHOD AND APPARATUS FOR BAGGING MATERIAL

James N. Mullins, Jr., Fort Worth, Tex., assignor to Polar Chips Manufacturing Co., Fort Worth, Tex.

Filed Aug. 26, 1977, Ser. No. 827,887

Int. Cl.[2] B65B *1/36, 43/26*

U.S. Cl. 53—452 8 Claims



1. A method of opening and filling a flexible plastic bag from a series of such bags having openable ends and being of the type that have a portion of their respective rearward sides extending above their forward sides, including the steps of: supporting the series of bags at their rearward sides while at the same time causing the foremost bag to have its extending portion inclined rearwardly and upwardly of the remainder of the bag to provide an inclined surface while the upper edge of the forward side of the bag remains in close proximity to the rearward side of the bag; the improvement comprising initially positively, simultaneously and equally pulling both edges of the forward side of the bag away from the rearward side to partially open the bag by placing a plurality of elements having respective thin bottom ends in sliding contact with said inclined surface and sliding them therealong into the interior of the bag, retaining the forward side of the bag thereon, and then moving said elements forwardly and upwardly and moving simultaneously and equally the forward side of the bag forwardly and upwardly to open the bag further and holding the bag opened only with said elements without requiring difficulty adjustable clamping mechanism; said bag being opened and held open in a controlled way in advance of a cavity having an aperture in its bottom for depositing a measured quantity of material within said bag when over the opened said bag, while continuing support of the side of the bag whereby the bag, including its lower end, is moved away from the next succeeding bag; moving along a bottom plate a cavity containing said material with a bottom aperture at least a rear portion of which is open such that said material will fall into said open bag first adjacent said rearward side to ensure fully operable opening of said bag; thereafter depositing said material from said cavity into said bag; and after depositing said material in said bag reversing and moving said elements to release said bag containing said material; and releasing and setting said bag containing said material in a predetermined position to facilitate further handling such as sealing and picking up by a consumer.

4,132,050

POLYOLEFIN FILMS

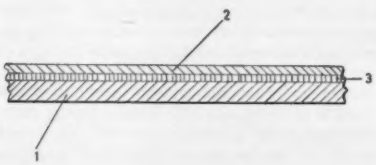
Roger N. Young, Chesham, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 523,530, Nov. 13, 1974, now Defensive Publication No. T941,020. This application Dec. 14, 1976, Ser. No. 750,519

Claims priority, application United Kingdom, Dec. 21, 1973, 59338/73

Int. Cl.[2] B32B *27/08, 27/32;* C08L *23/00, 53/00*

U.S. Cl. 53—463 14 Claims



1. A heat sealable film having improved heat seal strength comprising a polyolefin film substrate at least one surface of which is coated with a layer of a heat sealable material, wherein the film substrate is formed from a composition comprising a blend of from 75 to 85 parts by weight of polypropylene and from 25 to 15 parts by weight of a block copolymer of ethylene and propylene, the copolymer containing from 2 to 14% by weight of ethylene, based on the weight of the copolymer, and the blend containing from 0.5 to 2.1% by weight of ethylene, based on the weight of the blend.

2. A method of packaging merchandise, comprising:

wrapping said merchandise in a heat sealable polyolefin film according to claim 1, and

heat sealing said film to effect closure of said film package.

4,132,051

METHOD FOR THE MANUFACTURE OF PACKING CONTAINERS

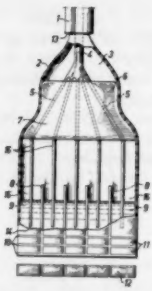
Ruben A. Rausing, Rome, Italy, assignor to Tetra Pak Developpement SA, Lausanne, Switzerland

Filed Jul. 7, 1977, Ser. No. 813,691

Claims priority, application Switzerland, Jul. 15, 1976, 9114/76

Int. Cl.[2] B65B *3/02, 9/12*

U.S. Cl. 53—452 10 Claims



1. A method of manufacturing individual container units comprising the following steps:

extruding a tube of plastic material through an annular extrusion die to obtain a cylindrical tube having a first diameter and a longitudinal axis;

biaxially stretching the extruded tube by inflating the tube to a second diameter that exceeds the first diameter and stretching the tube along the longitudinal axis;

cooling the extruded tube while drawing over an internally disposed cooling element;

laterally elongating the tube keeping the perimeter constant while drawing the tube over the internally disposed element;

dividing the laterally elongated tube into a plurality of longitudinal tubes with longitudinal sealing elements, the longitudinal tubes being joined along longitudinal sealed areas;

filling the longitudinal tubes;

successively sealing the longitudinal tubes transversely of the longitudinal axis to form closed containers joined along transverse sealed areas; and

cutting through the longitudinal and transverse sealed areas to separate the transversely sealed longitudinal tubes into individual container units.

4,132,052

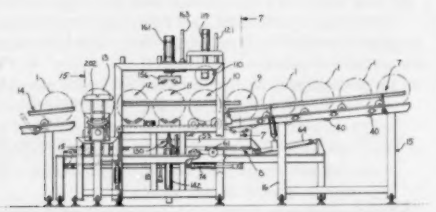
APPARATUS FOR REMOVING BUNGS FROM KEGS

Robert M. Larson, Mequon, Wis., assignor to Jos. Schlitz Brewing Company, Milwaukee, Wis.

Filed Jul. 1, 1977, Ser. No. 812,127

Int. Cl.[2] B67B *7/42;* B65B *57/00*

U.S. Cl. 53—75 15 Claims



1. In an apparatus for automatically removing a bung from a bung hole in a keg, said apparatus having an orienting station for rotating the keg about its axis to position the bung downwardly and a bung removing station for removing the downwardly facing bung, the improvement comprising, support means for supporting the keg at the orienting station, drive means disposed to engage the keg and rotate the keg about its axis, first sensing means for sensing the presence of a first portion of the keg as the keg is rotated and operably connected to the drive means for reducing the speed of said drive means, and second sensing means for sensing the presence of a second portion of the keg and operably connected to the drive means for stopping operation of said drive means to stop rotation of the keg.

4,132,053

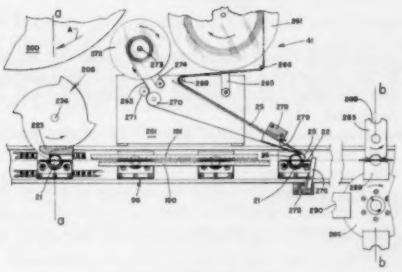
APPARATUS FOR SECURING ARTICLES TO A DISPLAY BOARD

Stanford W. Dale, 5228 Brookdale Ct., Minnetonka, Minn. 55443

Filed Oct. 14, 1977, Ser. No. 842,279

Int. Cl.[2] B65B *61/00*

U.S. Cl. 53—137 15 Claims



1. Apparatus for the preparation of display packages, having an article supported by a display card and at least one label, comprising:

a conveyor assembly for moving horizontal display cards through said apparatus whereby operations for forming the display package can be performed said conveyor assembly includes a plurality of card grippers for holding a portion of a display card;

a card feeding assembly for supplying single cards to said conveyor assembly;

means for folding a display card to present a vertically disposed portion for receipt of the article;

article feeding means for supplying the article to be packaged to said conveyor assembly and in juxtaposition with said vertical portion of the card;

labelling means; and,

affixing means for securing said label directly to the article and the display card to thereby secure the article to the card.

4,132,054

HACKAMORE BRIDLE

Oscar J. Mader, Box 598, Buffalo, Wyo. 82834

Filed May 3, 1976, Ser. No. 682,441

Int. Cl.[2] B68B *1/04*

U.S. Cl. 54—6 R 6 Claims

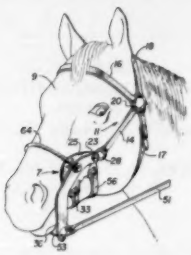
1. A hackamore horse bridle, comprising:

stationary headstall means including a chin strap, a pair of cheek straps each having a forward end, and a pair of cheek plates each having a forward portion, a central portion and a rear portion, the forward end of each of said cheek straps being connected to a respective one of said cheek plates at the rear portion thereof, and the chin strap being connected between the cheek plates at the respective rear portions thereof, so that said headstall means may

be fixedly positioned on the head of a horse with said cheek plates adjacent the cheeks of the horse, the forward portions of said cheek plates extending from the central portions thereof in the direction of the horse's nose and mouth, and the rear portions of said cheek plates extending from the central portions thereof in the direction of the horse's neck;

an eyelet mounted on the central portion of each of said cheek plates;

reining means including a pair of reins and a pair of elongate



levers, each of said levers having one end thereof pivoted to the rear portion of a respective one of said cheek plates and the other end connected to a respective one of said reins; and

nose strap means connected between the central portions of said levers and passing freely through said eyelets, whereby pivoting of said levers causes pressure to be exerted substantially solely on the nose of a horse having said headstall positioned thereon without appreciably causing pressure to be exerted by said chin strap on said horse.

4,132,055

EQUESTRIAN HARNESS AND SADDLERY EQUIPMENT

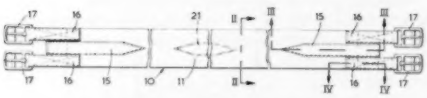
Elizabeth A. Bird, Mill House, Mill Lane, Wychbold, Droitwich, West Midlands, England

Filed Sep. 13, 1976, Ser. No. 722,597

Claims priority, application United Kingdom, Sep. 12, 1975, 37531/75

Int. Cl.[2] B68C *1/00, 1/14*

U.S. Cl. 54—23 **9 Claims**



1. A body strap component of equestrian harness equipment comprising:

(a) an elongate tubular webbing sheath having a woven endless cross-section and being closed at opposite ends thereof,

(b) said sheath being woven from yarn composed of staple fibers of synthetic polymer material,

(c) an insert filling composed of at least one strip of foam expanded plastics material extending between said closed ends of said sheath and filling the interior thereof,

(d) two end straps secured to each end and along each edge of the sheath and a central longitudinally extending reinforcing band being disposed between each pair of end straps,

(e) said end straps and bands being composed of a material having an elasticity less than the elasticity of the sheath,

(f) said end strps extending a first limited distance along the length of the sheath and said bands extending a second limited distance along the sheath beyond the end straps to reduce the overall elasticity of the body strap component, and

(g) strap fastening fittings such as buckles carried by said end straps.

4,132,056

OPEN END SPINNING APPARATUS

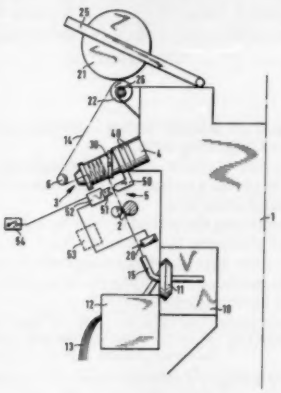
Gerd Hüsges, and Eberhard Grimm, both of Ingolstadt, Fed. Rep. of Germany, assignors to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany

Filed Dec. 13, 1976, Ser. No. 750,130

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1975, 2558419; Switzerland, Mar. 25, 1976, 3711/76

Int. Cl.[2] D01H *15/00*

U.S. Cl. 57—263 **10 Claims**



1. In an open-end spinning apparatus wherein yarn is produced in a spinning compartment and withdrawn therefrom by yarn withdrawal rollers and a winding device, a yarn storage device interposed between said yarn withdrawal rollers and said winding device and a knock-off motion positioned between said spinning compartment and said yarn withdrawal rollers for producing a signal responsive to changes in tension in said yarn, the improvement comprising:

(a) said yarn storage device including:

(i) a roller storage,

(ii) means for driving said roller storage in a forward direction for storing yarn thereon during normally running of said open-end apparatus and permitting said roller storage to be rotated in a reverse direction for withdrawing yarn therefrom during piecing up operation,

(b) said yarn being produced in said spinning compartment following a path from said spinning compartment, past said knock-off motion, around said roller storage to be wound on said winding device;

(c) a yarn gripper carried between said yarn storage roller and said yarn withdrawal roller, operably connected to said knock-off motion for gripping said yarn and holding said yarn in a generally stationary position responsive to receiving said signal from said knock-off device indicating a change in tension in said yarn;

whereby said yarn extending between said yarn gripper and said yarn storage device can be readily grasped and withdrawn from said roller store for insertion in said spinning compartment when a breakage in said yarn occurs.

4,132,057
PROCESS AND APPARATUS FOR PNEUMATIC SEPARATION AND ASPIRATION OF BROKEN THREAD ENDS

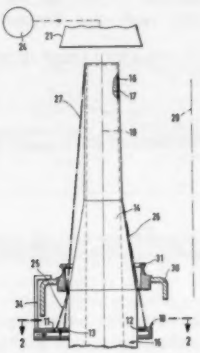
Helmut Weiss, Göppingen-Bartenbach; Harald Kraft, and Wolfgang Igel, both of Ebersbach, Fils, all of Fed. Rep. of Germany, assignors to Zinser Textilmaschinen GmbH, Ebersbach, Fed. Rep. of Germany

Filed Oct. 1, 1976, Ser. No. 728,757

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1975, 2543767

Int. Cl.² D01H *13/00, 15/00*

U.S. Cl. 57—261 **23 Claims**



1. A process for the pneumatic separation and sucking-in of a broken end of a thread from the truncated cone-shaped upper area of a thread winding body, comprising the steps of:

(a) directing a stream of suction air to a suction source located in proximate relationship to the thread winding body; and

(b) directing at least two air streams from a horizontally movable cradle member in a direction along the thread winding body and toward the suction air stream, wherein the at least two air streams are displaced relative to one another in the peripheral direction of the thread winding body and variably inclined relative to the longitudinal axis of the thread winding body.

2. In an apparatus for the pneumatic separation and sucking-in of a broken end of a thread from the truncated cone-shaped upper area of a thread winding body, comprising:

a textile machine spindle defining an axis of rotation; a casing stuck onto the spindle; and a suction producing device located above the spindle, the improvement comprising horizontally movable cradle member means from which at least two air streams are directed along the thread winding body and toward the suction producing device, wherein the at least two air streams have a different slope relative to the spindle axis of rotation and are mutually displaced in the peripheral direction of the spindle.

4,132,058
INSERT TRAVELLER

Brian K. M. Eadie, Brookfield; James W. Craighead, Glasgow; Alistair A. McKerrell; Robert Wilson, both of Paisley, and William A. White, Glasgow, all of Scotland, assignors to Textile Mouldings Limited, Accrington, England

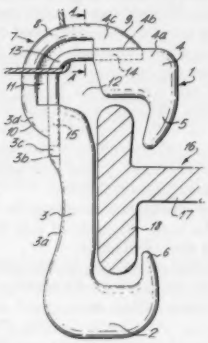
Filed Sep. 13, 1977, Ser. No. 832,780

Claims priority, application United Kingdom, Sep. 23, 1976, 39453/76

Int. Cl.² D01H *7/60*

U.S. Cl. 57—125 **6 Claims**

1. An insert traveller for a ring spinning or twisting frame comprising an upper hook portion and a lower hook portion interconnected by a shank, the portions and the shank being formed of plastics material, and an insert of a hard wear resistant material for contacting the yarn arranged at the junction of and extending only part way into the upper hook portion and the shank, wherein each of the upper hook portion and the shank includes a portion extending outwardly from the main



body of the upper hook portion and shank respectively and the part of the insert embedded in the hook portion and the shank respectively is substantially coextensive with said outwardly extending portion and is arranged adjacent or beyond the outermost surface of the respective main body.

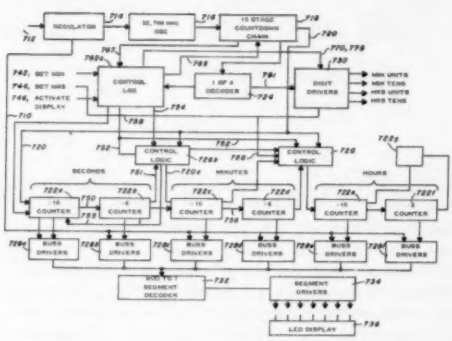
4,132,059
STACKED LOGIC DESIGN FOR I^2L WATCH

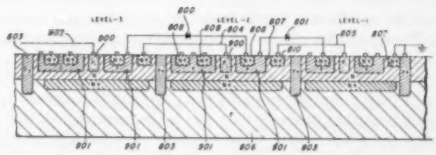
Clark R. Williams, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 443,535, Feb. 19, 1974, Pat. No. 4,013,901. This application Jan. 11, 1977, Ser. No. 758,513

Int. Cl.² G04C *3/00;* **H03K** *1/02, 19/08*

U.S. Cl. 58—23 A **11 Claims**





1. A digital electronic watch comprising:

(a) a housing;

(b) display means contained within said housing and being visible from the exterior of said housing;

(c) electronic timekeeping circuitry contained within said housing and responsive to a reference frequency signal for generating electrical signals indicative of timekeeping

functions, said display means being coupled to said timekeeping circuitry and responsive to said electrical signals for displaying said timekeeping functions;

(d) battery receiving means for receiving battery means to power said electronic timekeeping circuitry; and

(e) said electronic timekeeping circuitry being in the form of a monolithic semiconductor integrated circuit having first and second terminals coupled to said battery receiving means and arranged in at least first and second logic levels with each of said logic levels having at least one logic input and at least one logic output and being comprised of:

(i) a plurality of interconnected logic elements with each of said logic elements being comprised of semiconductor devices and having first and second power electrodes for energization thereof;

(ii) first means electrically coupling the first power electrodes of the logic elements of said first level in common to said first terminal;

(iii) second means electrically coupling the second power electrodes of the logic elements of said second level in common to said second terminal;

(iv) third means electrically coupling the second electrodes of the logic elements of said first level in common to the first electrodes of the logic elements of the second level; and

(v) a PN junction device coupling the at least one logic output of said first level to the at least one logic input of said second level.

4,132,060

ELECTRONIC TIMEPIECE

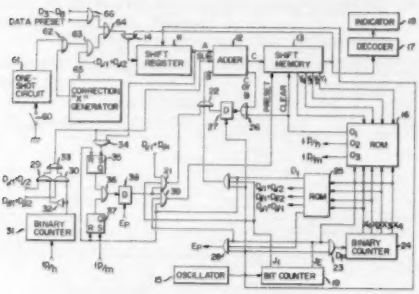
Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Jun. 24, 1977, Ser. No. 809,710

Claims priority, application Japan, Jun. 24, 1976, 51-73826; Jun. 24, 1976, 51-73827

Int. Cl.[2] G04B *27/00*

U.S. Cl. 58—23 R **6 Claims**



1. An electronic timepiece comprising a reference oscillator; shift memory means adapted to be controlled in accordance with an oscillation signal from the reference oscillator and having a plurality of time count memory sections corresponding to an equal number of time count units and a cycle number memory section arranged such that it is preceded by the plurality of time count memory sections, said shift memory means being such that memory data can be sequentially shifted as a carry from the cycle number memory section toward the successive time count memory sections; means for adding to the contents of the cycle number memory section for each data shift cycle of the memory shift means; means for permitting the contents of a smallest time unit memory section of said memory sections to be counted one step when the count value of said cycle number memory reaction reaches a predetermined cycle number and for permitting a carry to the subsequent large time unit memory sections; write means for writing a correction value x corresponding to an error per a predetermined unit time as induced between a standard oscillation frequency and an oscillation frequency of said reference oscillator; setting means for setting x number of correction timings into which said predetermined unit time is divided; and means for correcting said predetermined cycle number counted in the cycle number memory section for each timing set by said setting means.

4,132,061

WATCH MOVEMENT

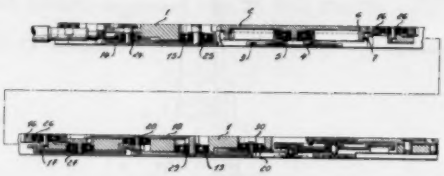
Pierre Mathys, Begnins, Switzerland, assignor to Bouchet-Lassale S.A., Geneva, Switzerland

Filed Feb. 1, 1977, Ser. No. 764,686

Claims priority, application Switzerland, Feb. 18, 1976, 1963/76

Int. Cl.[2] G04B *19/24*

U.S. Cl. 58—59 **2 Claims**



1. In a watch movement comprising a plurality of wheels mounted for rotation on a fixed plate; the improvement in which at least one of said wheels is mounted on a shaft which is fixed at one end to said plate and which is free at its end remote from said plate, and a single race miniaturized ball bearing by which said at least one wheel is mounted on said shaft.

4,132,062

DIGITAL WATCH CASE

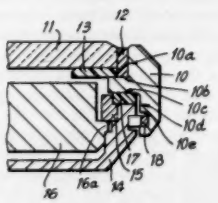
Yoshiaki Fujimori, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Apr. 25, 1977, Ser. No. 791,130

Claims priority, application Japan, Apr. 23, 1976, 51/47012

Int. Cl.[2] G04B *37/08, 39/00*

U.S. Cl. 58—90 R **10 Claims**



1. A digital watch case for receiving a digital display means comprising:

a watch barrel having an opening therethrough;

a cover glass mounted in the front end of said barrel;

a back cover connectable to the back end of said barrel, said barrel having an inner surface and formed with a flange having a front surface extending inwardly from said inner surface beyond the periphery of said cover glass towards the center of said barrel;

glass packing means compressively mounted between the periphery of said cover glass and the inner surface of said barrel at the front end of said barrel; and

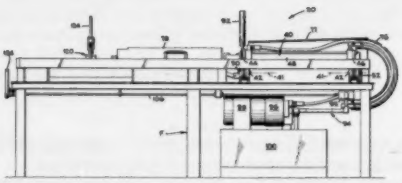
a parting plate member supported at least in part by the front surface of said flange, said parting plate member extending inwardly towards the center of said barrel beyond the

inner edge of the front surface of said flange and in contact with the bottom surface of said cover glass to define an opening sufficient to permit viewing of a digital display means in said watch case.

4,132,063
TRACK BUSHING MACHINE AND METHOD

Fred A. Craig, San Jose, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Oct. 20, 1977, Ser. No. 844,007
Int. Cl.[2] B21L *21/00*
U.S. Cl. 59—7 **22 Claims**

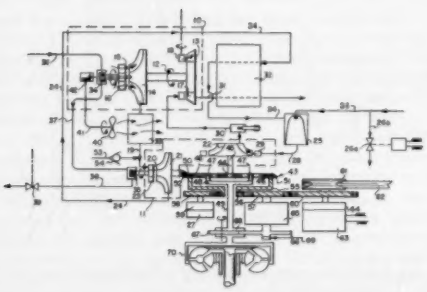


1. A track shoe assembly and rebuilding machine for track shoes having means defining two groups of axially spaced track shoe bores generated about parallel axes: comprising means for clamping a shoe in fixed position, a push rod, means for supporting said push rod for pivotal movement between a position in alignment with the axis of the first group of track shoe bores and the axis of the second group of track shoe bores, power means operatively connected to said push rod for first pushing the rod into and thereafter pulling the rod from one of said groups of track shoe bores, and for subsequently pushing the push rod into and thereafter pulling the rod from the other group of track shoe bores, and track shoe assembly-rebuilding means carried by said push rod for entry into said groups of track shoe bores when said push rod is pushed into said track shoe bores.

4,132,064
TURBINE ENGINE WITH DIFFERENTIAL GEARING BETWEEN HIGH PRESSURE TURBINE AND COMPRESSOR

Emerson L. Kumm, Tempe, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed May 26, 1977, Ser. No. 800,664
Int. Cl.[2] F02C *7/26, 3/10*
U.S. Cl. 60—39.14 **21 Claims**

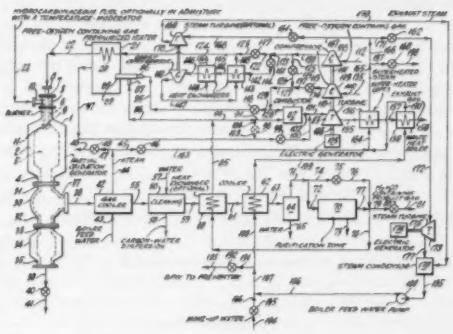


1. An engine comprising:
a first stage having a rotor with compressor and turbine wheel sections;
a second stage having separate compressor impeller and turbine wheel sections;
a combustor receiving compressed air from the compressor impeller of the second stage;
means supplying fuel to said combustor for mixture with the compressed air and ignition to generate heated gases;
duct means for directing air flow serially through said compressor of the first stage, said compressor of the second stage and to said combustor, and for directing said heated gases from said combustor serially through said turbine of the second stage and said turbine of the first stage;
differential gear means transmitting rotary movement from the turbine section of the second stage to the compressor impeller of said second stage; and
an output shaft leading from said differential gear means to transmit variable torque to a point of use.

4,132,065
PRODUCTION OF H_2 AND CO-CONTAINING GAS STREAM AND POWER

Rodney McGann, Santa Cruz, Calif., assignor to Texaco Inc., New York, N.Y.

Filed Mar. 28, 1977, Ser. No. 782,155
Int. Cl.[2] F02B *43/08*
U.S. Cl. 60—39.02 **32 Claims**



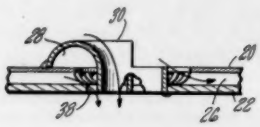
1. A process for the production of an H_2 and CO-containing gas stream along with power comprising: (1) producing a raw process gas stream comprising H_2, and CO and at least one member of the group CO_2, H_2O, H_2S, COS, CH_4, N_2, A, and entrained particulate solids in the reaction zone of a free-flow gas generator by the partial oxidation of a hydrocarbonaceous fuel with a heated stream of free-oxygen containing gas and in the presence of a temperature moderator, at a temperature in the range of about 1800 to 3000° F and a pressure in the range of about 10 to 200 atmospheres; (2) removing entrained solids if any, cooling, cleaning, and dewatering, said H_2 and CO-containing gas stream; (3) dividing at least a portion of said H_2 and CO-containing gas stream from (2) into a first gas stream which is reacted in the combustion chamber of a pressurized heater as fuel producing a stream of flue gas, and into a second gas stream which is burned as fuel in the combustor of a gas turbine comprising said combustor and an expansion turbine thereby producing a stream of exhaust gas, and passing said stream of exhaust gas through said expansion turbine as the working fluid; and (4) compressing a stream of free-oxygen containing gas in gas compression means powered by said expansion turbine, heating at least a portion of the compressed free-oxygen containing gas in said pressurized heater, and introducing the heated compressed free-oxygen containing gas into the gas generator in step (1).

4,132,066

COMBUSTOR LINER FOR GAS TURBINE ENGINE

George W. Austin, Jr., Glastonbury; Robert A. Breton, Old Saybrook; James J. Nolan, Glastonbury, and Edmund E. Striebel, South Windsor, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 23, 1977, Ser. No. 836,119
Int. Cl.[2] F02C 7/18
U.S. Cl. 60—39.65 8 Claims



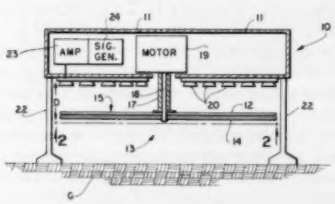
8. For a combustion chamber having a burner liner comprising inner and outer concentric walls, fins extending therebetween defining therewith open ended channels for directing cooling air therein to flow from an upstream end a predetermined distance and discharge into the combustion chamber at a downstream end, apertures formed in said burner liner to admit combustion or dilution air into the combustion chamber at a point intermediate the upstream and downstream ends of said open ended channels, an opening extending through said outer wall, fins and inner wall for admitting cooling air flowing over the outer wall into said combustion chamber, dam like elements between the outer and inner walls disposed at diametrically opposed junction points of the midpoint of said opening separating the upstream end from the downstream end in relation to said flow in said channels and means for readmitting cool air in said channels downstream of said dam like elements whereby the flow on the upstream end discharges into the combustion chamber and the reentry of cooling air downstream of said opening passes the remaining portion of the channels interrupted by the formation of said opening.

4,132,067

ACCOUSTIC PROPULSION SYSTEM

Robert J. Alderman, 812 59th St., NW., Bradenton, Fla. 33505

Filed May 27, 1977, Ser. No. 801,163
Int. Cl.[2] F02K 11/00
U.S. Cl. 60—204 14 Claims



8. A method of moving an object through a particulate medium comprising the steps of:

creating an oscillatory force field in said medium, the particles of which thereby oscillate in two opposite directions along the direction of said field;

transmitting the force of said particles upon said object when said particles are moving in the first of said opposite directions of oscillation; and

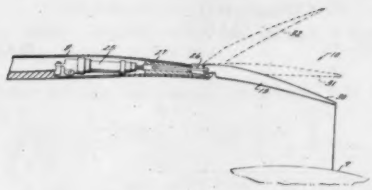
absorbing the force of said particles upon said object when said particles are moving in the second of said opposite directions of oscillation.

4,132,068

VARIABLE AREA EXHAUST NOZZLE

Everett A. Johnston, Mason, Ohio, assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 30, 1975, Ser. No. 573,029
Int. Cl.[2] B64C 15/06; F02K 3/06
U.S. Cl. 60—226 A 9 Claims



1. In a gas turbine engine housed within a generally cylindrical casing, a variable area exhaust nozzle comprising:

a plurality of arcuate flaps pivotally connected to the trailing edge of said casing;

actuator means connected to said flaps for positioning said flaps to vary the flow area through said nozzle and

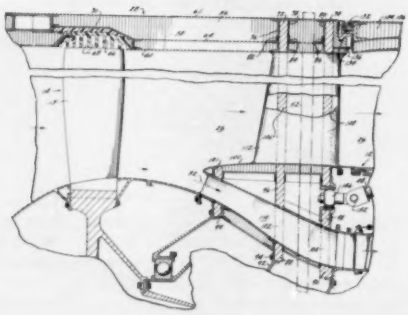
seal elements disposed within said flaps along the side edges thereof, said seal elements of adjacent flaps being biased outwardly beyond the side edges of said flaps, to mutually maintain sealing engagement when said flaps are within a predetermined range of positions and to interrupt sealing engagement when said flaps are outside of said predetermined range of positions.

4,132,069

INTEGRATED GAS TURBINE ENGINE-NACELLE

Arthur P. Adamson; Donald F. Sargisson, both of Cincinnati, and Charles L. Stotler, Jr., Fairfield, all of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation of Ser. No. 522,108, Nov. 8, 1974, abandoned. This application Dec. 22, 1976, Ser. No. 753,452
Int. Cl.[2] F02K 3/06, 1/20; F02C 3/06, 7/20
U.S. Cl. 60—226 R 14 Claims



1. A gas turbofan engine including a fan bypass flow annulus having an inlet and an exit, a core engine having an inlet duct communicating with said annulus, and a nacelle comprising:

pairs of axially spaced outer, intermediate and inner coannular composite hoops, web means of composite filament construction rigidly bonding the axially forwardmost of each of said pairs of hoops together and further bonding the axially rearwardmost of each of said pairs of hoops

together, wherein said pair of inner hoops is disposed within and attached to said core engine radially interior of said core engine inlet duct, and said pair of intermediate hoops is disposed within said core engine and extends substantially between the flow annulus and said core engine inlet duct;

inner and outer walls of composite filament fabrication bonded to and between said outer pair of hoops to partially define said flow annulus and the outer contour of the gas turbofan engine, respectively;

an intermediate wall of composite filament fabrication disposed between said inner and outer walls and extending axially between said pair of outer hoops to which it is bonded, wherein the pair of outer hoops and the outer, intermediate and inner walls are bonded with shear joints to form a pair of coannular inner and outer torque boxes for transferring bending moments from the walls, through said web means and into said core engine; and

composite core material bonded within said torque boxes.

4,132,070

POSTCOMBUSTION AIRFLOW REGULATING VALVE FOR INTERNAL COMBUSTION ENGINES

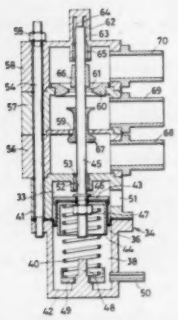
Gianpaolo Garcea, Milan, Italy, assignor to Alfa Romeo S.p.A., Milan, Italy

Filed Mar. 8, 1977, Ser. No. 775,533

Claims priority, application Italy, Mar. 12, 1976, 21165A/76

Int. Cl.[2] F01N *3/10*

U.S. Cl. 60—290 **3 Claims**



1. An exhaust gas post-combustion system for an internal combustion engine having an air induction duct including means for throttling the rate of drawn-in air and exhaust gas duct means, said system comprising nozzle means opening into said exhaust gas duct means for introducing air into said exhaust duct means, a metering air pump mechanically connected to the engine, a first valve assembly for receiving air from said pump and discharging a proportion thereof dependent upon the degree of opening of said first valve assembly, said first valve assembly comprising a first port and a frusto-conical valve member movable with respect to said port to vary the degree of opening of said first valve assembly, a diaphragm operatively connected to said frusto-conical member to control movements thereof, means for exposing one side of said diaphragm to negative pressure existing in said air induction duct downstream of said throttling means, means for exposing the opposite side of said diaphragm to pressure existing upstream of said throttling means, means biasing said diaphragm in opposition to the effect of said negative pressure whereby the degree of opening of said first valve assembly varies in accordance with variations in said negative pressure, said degree of opening increasing with increases in said negative pressure and decreasing with decreases in said negative pressure and being at a maximum when said negative pressure is at a maximum negative value, a second valve assembly for receiving air from said pump and delivering air to said nozzle means, said second assembly comprising a second port and a shutter member for said second port in the form of a spool valve operatively connected to said diaphragm, said spool valve having opposed flanges for closing said second port when said negative pressure is at maximum and minimum values respectively and said spool valve having an intermediate spool section between said flanges for opening said second port when said negative pressure is between said maximum and minimum values.

4,132,071

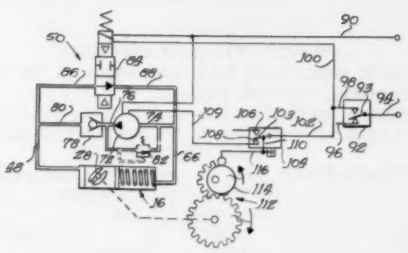
ELECTRO-HYDRAULIC CONTROLLED VALVE ACTUATOR SYSTEM

Werner K. Priese, Barrington, and Charles I. Koehlert, Dundee, both of Ill., assignors to Hills-McCanna Company, Carpentersville, Ill.

Filed Oct. 11, 1977, Ser. No. 840,602

Int. Cl.[2] F16D *31/00*; F15B *15/18*

U.S. Cl. 60—328 **12 Claims**



1. An electro-hydraulic controlled valve actuator system comprising: an actuator member including piston means mounted for reciprocation within a cylinder and means connecting said piston means for rotating a valve shaft, a hydraulic pump joined with said cylinder for selectively pumping hydraulic fluid in a selected direction between portions of said cylinder on opposite sides of said piston means to drive said piston means in a first direction, thereby rotating said valve shaft in a first corresponding direction, a valve connected for selectively by-passing said pump, resilient means yieldably biasing said piston means in a second direction opposite said first direction, whereby when said valve is open said hydraulic fluid flows therethrough allowing said resilient means to drive said piston means in said second direction to rotate said valve shaft in a second corresponding direction, and control means for selectively energizing said valve and said hydraulic pump for rotating said valve into and thereafter maintaining a preselected position.

4,132,072

HYDROSTATIC CONVERTER

Gunter R. Schlinke, Distelfinkweg 77, 1000 Berlin 47, Fed. Rep. of Germany

Filed May 3, 1977, Ser. No. 793,414

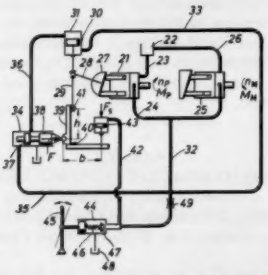
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1977, 2620692

Int. Cl.[2] F16H *39/46*

U.S. Cl. 60—443 **19 Claims**

1. Hydrostatic converter, infinitely adjustable by an adjusting organ with at least one hydromotor and at least one pump, the characteristic curve of the interrelation of discharge pressure p and piston displacement V_H of said pump having a hyperbolic portion which is determined by a torque regulator on said pump, the performance graph of said hydromotor showing the interrelation between driving torque M_M and motor speed n_M having a hyperbolic portion, characterized in that said torque regulator is provided with a regulating unit for producing a variable auxiliary power, the size of said power

which, for the purpose of moving said hyperbolic portion of said performance graph of said hydromotor (25, 54, 104, 113)



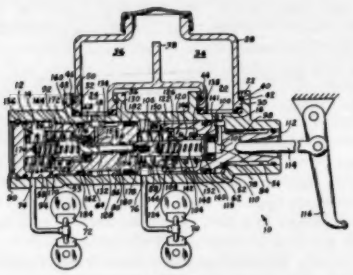
with the aid of said regulating unit (45, 84, 95, 108) for said pump (21, 50, 106, 112), is adjustable.

4,132,073

MASTER CYLINDER ASSEMBLY

Jerome T. Ewald, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Division of Ser. No. 718,445, Aug., 1976, Pat. No. 4,078,386.
This application Nov. 4, 1977, Ser. No. 848,429
Int. Cl.[2] B60T *11/20*
U.S. Cl. 60—562 5 Claims



1. A master cylinder comprising:

a housing having a bore therein;

reservoir means attached to said housing for retaining a supply of fluid, said reservoir means being connected to said bore through a first port and a second port;

a first piston located in said bore and cooperating with said housing to define a first chamber, said first piston having a first passage therein through which fluid is communicated from said first port into said first chamber;

a second piston located in said bore and cooperating with said housing to define a second chamber, said second piston having a second passage therein through which fluid is communicated from said second port to said second chamber;

a first valve seat member located in said first chamber for cooperating with a first valve member on said first piston to control communication between said first chamber and said first port;

a second valve seat member located in said second chamber for cooperating with a second valve member on said second piston to control communication between said second chamber and said second port;

linkage means for connecting said first valve seat member with said second valve seat member, said linkage means positioning said first and second valve seat members at substantially identical positions with respect to said first and second pistons;

input means for moving said first valve member on said first piston into engagement with said first valve seat member to interrupt fluid communication from the reservoir through said first passage and for moving said second valve member on said secod piston into engagement with said second valve seat member to interrupt fluid communication from the reservoir through said second passage and allow the development of fluid pressure in the first chamber and the second chamber at substantially the same time;

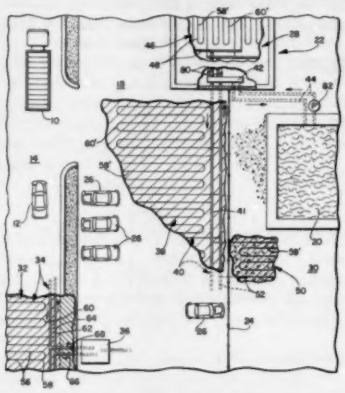
said linkage means including: a stem attached to said second valve seat member and extending through said second piston into said first pressurizing chamber; and a fastener adjustably secured to said stem and in abutment engagement with said first valve seat member, said fastener permitting adjustment of the spatial relationship between said first valve seat member and said first piston.

4,132,074

PAVING AND SOLAR ENERGY SYSTEM AND METHOD

Ion L. Wendel, St. Petersburg, Fla., assignor to James L. Lowe, St. Petersburg, Fla.

Filed Jun. 4, 1976, Ser. No. 692,892
Int. Cl.[2] F03G *7/02*
U.S. Cl. 60—641 5 Claims



1. A solar energy utilization system comprising in combination: a plurality of separate solar collectors each including a body having a surface exposed to solar energy and a plurality of liquid passages substantially entirely embedded within the body for conveying liquid for heat exchange with the body, a pool containing liquid to be heated, a closed conduit system including said passages and said pool, means for circulating liquid from the pool through said passages in said collectors and back to said pool, and an auxiliary liquid heating means for supplying heated liquid to said passages in said collectors independently of said pool, and wherein two of said solar collectors are connected in series with each other in said conduit system, and wherein there is included a third solar collector connected directly to said pool while bypassing said first two collectors.

4,132,075

METHOD OF PRODUCING MECHANICAL ENERGY FROM GEOTHERMAL BRINE

Raymond N. Fleck, West Covina, and Harvey Hennig, Fullerton, both of Calif., assignors to Union Oil Company of California, Brea, Calif.

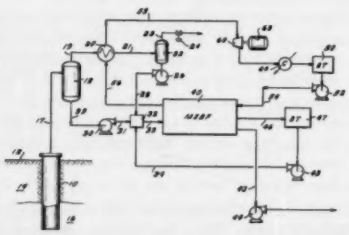
Filed Jun. 30, 1977, Ser. No. 811,680
Int. Cl.[2] F03G *7/00*
U.S. Cl. 60—641 28 Claims

1. A method for producing mechanical energy from geothermal brine, with comprises:

producing hot geothermal brine from a subterranean geothermal reservoir;

contacting said brine with a heat transfer fluid having a higher vapor pressure than said brine at the temperatures encountered;

passing said heat transfer fluid and said brine cocurrently through a series of separate flash stages, wherein each successive stage is maintained at a lower pressure less than the vapor pressure of the fluids entering the stage so that



at least a portion of the heat transfer fluid is flashed to vapor in each stage;

countercurrently flowing a working fluid successively through said series of flash stages in indirect heat exchange with the vapor produced in each flash stage, whereby the vapor is condensed in each stage and said working fluid is progressively heated as it passes through said series of flash stages; and

utilizing said working fluid in a heat engine to produce mechanical energy.

4,132,076

FEEDBACK CONTROL METHOD FOR CONTROLLING THE STARTING OF A STEAM TURBINE PLANT

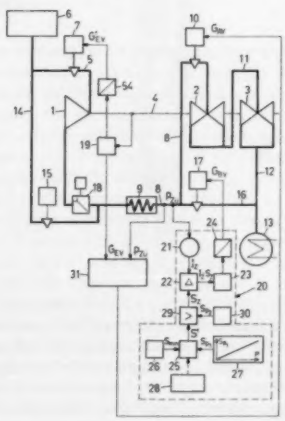
Gerhard Weiss, Oberrohrdorf, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Jul. 23, 1976, Ser. No. 708,038

Claims priority, application Switzerland, Aug. 22, 1975, 10897/75

Int. Cl.[2] F01K *13/92*

U.S. Cl. 60—646 **28 Claims**



1. Feedback control method for controlling the starting of a steam turbine unit having a high pressure (HP) turbine, a reheater, an intermediate/low pressure (MP/LP) turbine and conduit means fluidly connecting said turbines and reheater, having at least one inlet valve to admit steam to the HP-turbine and at least one intercept valve to admit steam to the MP/LP-turbine, having a HP-bypass system passing the HP-turbine and comprising at least one regulating valve disposed therein, having a LP-bypass system passing the MP/LP-turbine and comprising at least one regulating valve disposed therein, and having a governing device to regulate the turbine speed or power output, according to which method during no-load and low-load operation and up to a specifically predetermined partial load the pressure within the reheater is regulated by the LP-bypass regulating valve functioning to conduct steam through the LP-bypass in such manner that a greater quantity of steam flows through the HP-turbine than through the MP-turbine, and a smaller quantity of steam flows through the HP-bypass system than through the LP-bypass system, whereby a maximum permissible HP-exhaust steam temperature will not be exceeded and, when the partial load is greater than specified, the pressure within the reheater is regulated by the intercept valve functioning to conduct steam flow to the MP/LP-turbine until the at least one intercept valve is fully open, while the LP-bypass regulating valve is closed during this part of the operation.

4,132,077

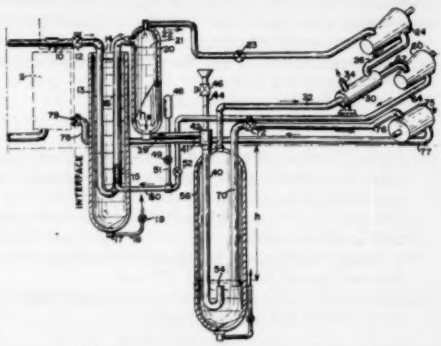
PROCESS AND APPARATUS FOR OBTAINING USEFUL ENERGY FROM A BODY OF LIQUID AT MODERATE TEMPERATURE

Don E. Johnson, 256 N. Fraser Dr. West, Phoenix, Ariz. 85203

Filed Feb. 2, 1977, Ser. No. 764,762

Int. Cl.[2] F01K *25/06*

U.S. Cl. 60—649 **21 Claims**



11. Apparatus for extracting heat from warm liquid which is below its boiling point which comprises the following elements, in combination:

(a) A riser column for conducting a stream of said liquid from a level where it is under at least some pressure tending to move the liquid into said conduit to a higher level,

(b) Means for injecting a stream of cold gas into said conduit and into the stream of liquid therein in a manner to form numerous discrete bubbles of gas in said stream so as to aerate said stream and start it rising in said column, whereby the gas will extract heat from said warm liquid and expand to accelerate upward flow and thereby generate kinetic energy in said stream,

(c) A separator and storage vessel at said higher level adapted to receive said accelerated stream from said conduit and to slow its velocity very substantially, thereby converting kinetic energy to pressure or potential energy, and putting the gas and liquid under static pressure, and

(d) Means connected to said separator storage vessel for expanding said pressurized gas and cooling said gas while recovering useful energy therefrom.

4,132,078

PISTON MACHINE

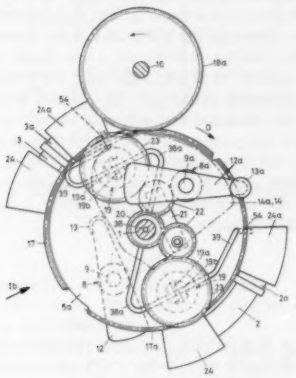
Richard Akeret, Winterhur, Switzerland, assignor to Enginor AG, Switzerland

Filed Jun. 6, 1977, Ser. No. 804,173

Claims priority, application Switzerland, Jul. 27, 1976, 9607/76; Nov. 9, 1976, 14109/76

Int. Cl.[2] F02C *1/02*

U.S. Cl. 60—682 **24 Claims**



1. A piston machine comprising:

first and second supporting parts mounted for rotation about a common axis and for pivotal movement with respect to one another about said axis;

a piston mounted on the first part spaced from said axis;

a cylinder mounted on said second part, slidably receiving the piston, and similarly spaced from said axis for relative reciprocal movement with the relative pivotal movement of the supporting parts;

cam means fixed about said axis;

cam follower and connector gear means carried swivelably on each of said supporting parts for cooperatively engaging said cam means and an opposite one of the supporting parts for controlling the relative pivotal positions of the supporting parts during 360° of rotation;

valve means for controllably passing a compressible fluid to and from the cylinder;

first and second segment gears respectively carried by said first and second parts; and

a power shaft having a pinion means engageable sequentially with each of said segment gears.

4,132,079

APPARATUS FOR REMOTELY OPERATING SELF-ADVANCING SUPPORTS OR THE LIKE

Tsunetoshi Ito, Tokyo, and Hideo Inoue, Yokohama, both of Japan, assignors to Taiheiyo Engineering Incorporated, Tokyo, Japan

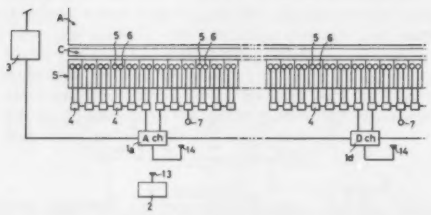
Filed Jul. 27, 1977, Ser. No. 819,322

Claims priority, application Japan, Feb. 28, 1977, 52-21710

Int. Cl.[2] E21D *15/44*

U.S. Cl. 405—299 **9 Claims**

1. An apparatus for remotely operating self-advancing supports along a long-walled pit face of a coal mine, comprising hydraulic cylinders attached to said self-advancing supports for operating the self-advancing supports along said long-walled pit face, said self-advancing supports being divided into a plurality of groups with each group consisting of a plurality of self-advancing supports, a radio receiver means connected to each of said groups of self-advancing supports, each of said radio receiver means operating under a different specific frequency, electromagnetic valves connected to said receiver means and operable to actuate said hydraulic cylinders to thereby control said self-advancing supports, and a portable radio transmitter means located remotely from said receiver means for transmitting radio signals to said receiver means such that the receiver means effect actuation of said electromagnetic valves, said transmitter means comprising a plurality of manually operable key elements manually operable to select the particular group of self-advancing supports to be operated and to select the particular hydraulic cylinder of the group to



be operated, said transmitter means further comprising manually operable switches to effect the desired actuation of the selected hydraulic cylinder, whereby operating radio signals are transmitted from the remotely located transmitter means to the selected receiver means and the latter effects the desired actuation of the selected hydraulic cylinder through said electromagnetic valves.

4,132,080

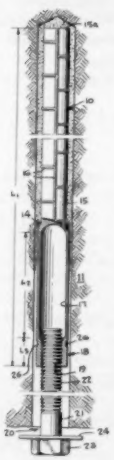
RESIN ANCHORED ROCK OR MINE ROOF BOLT ANCHOR MECHANISM

Roger M. Hansen, Birmingham, Ala., assignor to Stratabolt Corporation, Pelham, Ala.

Filed Nov. 7, 1977, Ser. No. 849,634

Int. Cl.[2] E21D *21/02*

U.S. Cl. 405—261 **10 Claims**



1. A rock and mine roof anchor and bolt assembly of the resin anchored type to be mounted in a bore hole in a mine roof rock formation or the like for strengthening the same, comprising an elongated anchor member of generally cylindrical configuration having a shorter length than the depth of the bore hole in which it is to be fitted and having an uninterrupted upper end surface and a lower permanently interconnected end portion, the anchor member having an elongated axial bore in at least the lower end portion thereof and a constricted diameter threaded entrance throat having female threads and opening through the lower end portion, a bolt having a threaded stem portion having male threads threaded into the female

threads of said anchor member and having an enlarged head portion and bearing plate means to be drawn tightly against the face of the rock formation, the anchor member being adapted to be introduced into the bore hole in assembled relation with the bolt after insertion of a destructible cartridge containing quick-setting adhesive resin therein to crush the cartridge and mix and distribute the adhesive material throughout the space outwardly surrounding most of the anchor member and adhesively fixing the anchor member in the bore hole upon hardening of the adhesive material thereabout, said female threads including distorted thread portions providing controlled interference between said female and male threads inducing resistance to rotation of the bolt relative to the anchor member and thereby form a controlled torque thread zone with the threads of the bolt, the bolt being initially assembled in threaded relation with the threaded throat of the anchor member to a position wherein the distorted thread portions of the female threads exert a predetermined restraint to relative rotation of the bolt with respect to the anchor member until a predetermined threshold controlled torque force is exceeded, and said distorted thread portions accommodating further threaded insertion of the bolt into the bore of the anchor member when the anchor member is restrained against rotation by setting of the adhesive resin and torque in excess of the predetermined threshold amount is applied to the bolt.

4,132,081

MINE ROOF SUPPORT

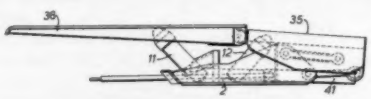
John H. Walker, and James A. Sutton, both of Cheltenham, England, assignors to Dowty Mining Equipment Limited, Tewkesbury, England

Filed Mar. 9, 1977, Ser. No. 775,995

Claims priority, application United Kingdom, Mar. 13, 1976, 10178/76

Int. Cl.² E21D *15/44*

U.S. Cl. 405—296 **8 Claims**



1. A mine roof support comprising a floor-engaging member resistant to bending along its whole length, a roof-engageable member above the floor-engaging member, a shield, a pivot means securing the roof-engageable member to the shield, a linkage securing the shield to the floor-engaging member for angular movement relative thereto to constrain the pivot means to a substantially straight path of movement towards and away from the floor-engaging member, an extensible forward leg, a pivotal connection on the roof-engageable member and a pivotal connection on the floor-engaging member between which connections the forward leg is secured lengthwise, an extensible rearward leg, a pivotal connection on the floor-engaging member and a pivotal connection on the shield between which pivotal connections the rearward leg is secured lengthwise, the said pivotal connections of said legs on the floor-engaging member being more closely spaced apart than said pivotal connections of said legs on said roof-engageable member and said shield, shortening of the legs to lower the roof-engageable member towards the floor-engaging member causing pivoting of both legs relative to the floor-engaging member, and in the lowest position for the roof-engageable member above the floor-engaging member the legs being at or near their minimum length and each leg being inclined at an acute angle to the floor-engaging member which angle is smaller than for elevated settings of the support.

4,132,082

PILING

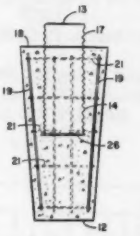
Stanley Merjan, 16 Beacon Dr., Port Washington, N.Y. 11050

Division of Ser. No. 601,728, May 4, 1975, abandoned, which is a division of Ser. No. 303,706, Nov. 6, 1972, Pat. No. 3,913,337, which is a continuation-in-part of Ser. No. 256,165, May 23, 1972, Pat. No. 3,875,752, which is a continuation-in-part of Ser. No. 235,790, Mar. 17, 1972, Pat. No. 3,751,931, which is a continuation-in-part of Ser. No. 97,997, Dec. 4, 1970, abandoned.

This application Nov. 26, 1976, Ser. No. 745,405

Int. Cl.² E02D *5/30*

U.S. Cl. 405—253 **5 Claims**



1. A tip for a pile having a tubular metal stem, which stem is filled with concrete after the pile is driven, said tip being of reinforced concrete and having an upper central cavity adapted to receive said filling of concrete, said tip being tapered to increase in diameter from the bottom upwards, the maximum cross-sectional area of the tip being about 5 to 15 times the cross-sectional area of the stem, the taper being less than about 3 inches per foot and the axial height of said tip being at least about 2 feet, and in which said tip has an upper central tubular liner rigidly embedded in the concrete of said tip and to which the stem is adapted to be attached before said pile is driven.

4,132,083

SERVICE CONNECTION BETWEEN A MAIN AND A METER IN A BUILDING AND METHOD OF AND EQUIPMENT FOR INSTALLING THE SAME

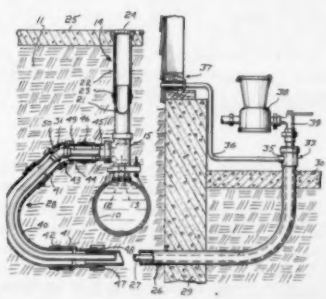
Robert L. McGrath, Hollis St., East Pepperell, Mass. 01437

Division of Ser. No. 610,565, Sep. 5, 1975, Pat. No. 4,062,376.

This application Sep. 12, 1977, Ser. No. 832,811

Int. Cl.² F16L *5/00*

U.S. Cl. 405—184 **5 Claims**



1. Apparatus for use in installing a second flexible subterranean member with a first flexible member already extending underground between two openings, said apparatus comprising a flexible wedge including a flexible connector, means at the ends of said connector connectable to an end of said first flexible member and to an end of the second flexible member, a first series of balls diametrically supported by said connector,

the balls of said series increasing in diameter from one end of the connector towards the other end thereof with the diameter of the largest ball being substantially that necessary to provide a passageway for the second tubular member and a second series of balls diametrically supported by said connector, each ball of the second series of a diameter less than at least the majority of the balls of the first series and separating the balls thereof.

4,132,084

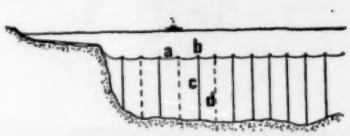
SUBMARINE CONDUCTOR FOR THE DEEP SEA TRANSMISSION OF HIGH VOLTAGE ELECTRICAL POWER

Richard D. Francisco-Arnold, P. O. Box 452, Bronxville, N.Y. 10708

Continuation-in-part of Ser. No. 605,933, Aug. 19, 1975, abandoned. This application Oct. 29, 1976, Ser. No. 736,737

Int. Cl.[2] F16L *1/00*

U.S. Cl. 405—171 **3 Claims**



1. An improved thermally active submarine conductor for the transmission of high voltage electrical power within a body of water the maximum depth of which exceeds the maximum depth operative capacity of practically viable available conductors for the said transmission; and which comprises a number of elements comprising at least a single semi-flexible thermally active linear high voltage conductor element; a number of elements comprising at least a single semi-flexible thermally active high voltage insulation element completely disposed about the said conductor element; a number of elements comprising at least a single semi-flexible sheathing and mechanical armoring element as required completely disposed about the aforesaid elements; a number of buoyant compensation elements disposed proximately about the aforesaid elements in number, size and buoyant capacity so as to maintain at approximately specific gravity, when further comprising therealong a number of tethering/mooring and anchoring stabilisation elements sufficient to provide at least a partially scoped non-tensioned deployment geometry for a prescribed degree of controlled free-flotation of the aforesaid elements; as well as a required number of elements for interconnecting all of the aforesaid elements into a complete functional entity, following a specified submarine routing suspended within the said body of water at a depth or linear plurality thereof following therealong, within a prescribed variance range circumscribing the said routing according to ambient sea conditions and said tethering/mooring prescribed geometry.

4,132,085

CONTROL APPARATUS INCLUDING AN ELECTRONIC TIMER

Kenji Maio; Fumiyuki Inose, both of Kokubunji; Norio Yokozawa, Fuchu; Ryoichi Fujimoto, Ohira, and Kazuo Takasugi, Higashi-Yamato, all of Japan, assignors to Hitachi, Ltd., Japan

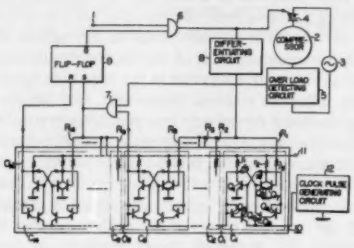
Continuation of Ser. No. 480,476, Jun. 18, 1974, abandoned. This application Mar. 26, 1976, Ser. No. 670,724

Claims priority, application Japan, Jun. 20, 1973, 48/68778; Aug. 31, 1973, 48/97304

Int. Cl.[2] F25D *21/06;* **G01R** *29/02*

U.S. Cl. 62—155 **27 Claims**

1. A control apparatus comprising an electronic timer including a plurality of flip-flop circuits connected in multiple stages of first to n-th stages in cascade of that order for counting clock pulses applied to said first stages, means for taking out outputs from different stages in said electronic timer, means for producing from said outputs, separately, individual control timing signals, means for controlling at least one device by each of said control timing signals at a timing specific



thereto, and means independent of the clock pulses applied to said timer for clearing the output of at least one of said different stages at a timing different of that for clearing of the output of another of said different stages.

4,132,086

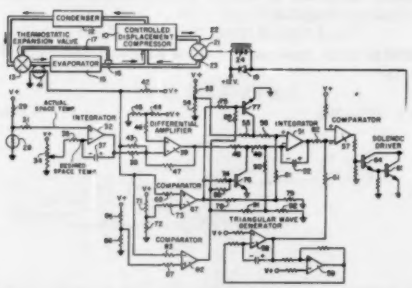
TEMPERATURE CONTROL SYSTEM FOR REFRIGERATION APPARATUS

Kenneth J. Kountz, Hoffman Estates, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Mar. 1, 1977, Ser. No. 773,379

Int. Cl.[2] F25B *1/00*

U.S. Cl. 62—209 **23 Claims**



1. In a refrigeration system where refrigerant flows through a closed vapor cycle refrigeration circuit having an evaporator, a controlled displacement compressor, a condensor and a thermostatic expansion device, a control system for controlling the operation of the refrigeration system to vary the evaporator boiling pressure, and consequently the capacity of the evaporator, in order to maintain a substantially constant desired temperature in a space to which cooled air is supplied by the refrigeration system, comprising:

means for providing a space temperature signal representing the actual ambient temperature in the space to be temperature controlled;

means for providing a temperature set point signal representing the desired temperature for the temperature controlled space;

means for providing an evaporator pressure signal representing the actual pressure of the refrigerant flowing through the evaporator;

and control means responsive to said space temperature signal, said temperature set point signal, and said evaporator pressure signal for varying the displacement of the controlled displacement compressor to modulate the refrigerant flowing through the evaporator to adjust the evaporator boiling pressure to vary the evaporator capac-

ity as required to maintain the controlled space at the desired temperature.

4,132,087

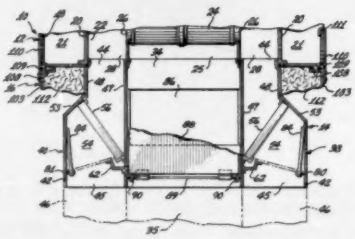
AIR CONDITIONING ASSEMBLY

Adam D. Goettl, 4960 E. Palomina Rd., Phoenix, Ariz. 85018

Continuation-in-part of Ser. No. 655,868, Feb. 6, 1976, abandoned. This application Oct. 3, 1977, Ser. No. 838,495

Int. Cl.[2] F25D *21/14*

U.S. Cl. 62—285 **12 Claims**



1. An air conditioning assembly comprising:

(a) an air conditioning structure having an air outlet opening formed centrally in one surface thereof and at least one auxiliary air inlet opening formed in that same surface adjacent the air outlet opening;

(b) a supply spanner duct connected to the air outlet opening of said air conditioning structure for directing air from said air conditioning structure to a point of use;

(c) a return air handler duct connected to the auxiliary air inlet of said air conditioning structure for directing air returning from a point of use to said air conditioning structure;

(d) an air treatment device mounted within said return air handler duct for treating the air passing therethrough;

(e) an exhaust duct communicating with said supply spanner duct and extending laterally therefrom; and

(f) damper means mounted proximate the junction of said exhaust duct with said supply spanner duct and pivotably movable between a position where said exhaust duct is closed and a position where said supply spanner duct is closed.

6. An air conditioning assembly comprising:

(a) an air conditioning structure having an air outlet opening formed centrally in the bottom surface thereof and at least one auxiliary air inlet opening formed adjacent the air outlet opening;

(b) a supply spanner duct coupled to the air outlet opening of said air conditioning structure for directing air therefrom to a point of use;

(c) a return air handler duct coupled to the auxiliary air inlet opening of said air conditioning structure for directing air from the point of use to said air conditioning structure, said return air handler duct having an enlarged chamber formed therein;

(d) an air treatment device mounted within the enlarged chamber of said return air handler duct;

(e) thermally insulative material in engagement with the peripheral surfaces of said supply spanner duct and said return air handler duct; and

(f) stand-enclosure means for demountably supporting said air conditioning structure and for protectively enclosing said thermally insulative material.

4,132,088

REFRIGERATING MACHINE IN FLAT UNIT CONSTRUCTION

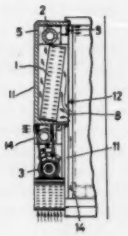
Peter V. Grosskopf, Am Ruhrstein 25a, 4300 Essen, Fed. Rep. of Germany

Filed Dec. 27, 1976, Ser. No. 754,226

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1975, 2558821

Int. Cl.[2] F25D *19/00;* B60H *3/04;* F25D *23/12*

U.S. Cl. 62—298 **5 Claims**



1. A refrigerating machine for securing to the exposed exterior vertical wall of an enclosed insulated container, said refrigerating machine comprising an outer box-like frame casing for securing to the vertical wall of the insulated container, an elongated transversely extending cross-current blower means positioned in the upper end of said frame casing for discharging cold air, a discharge outlet slot in said casing extending substantially the full width of said casing and across said cross-current blower means for discharging cold air into the upper air inlet of said insulated container, an evaporator positioned in said frame casing below said cross-current blower means, an air inlet opening located substantially centrally of the vertical height of said frame casing and spaced downwardly a substantial distance from said discharge outlet slot and extending substantially across the full width of said casing to deliver air to said lower portion of said evaporator, a compressor disposed in said casing below said evaporator for the refrigerant being mounted to said casing, a cross-current blower means for ventilating said compressor and extending transversely across the lower portion of said frame casing and being spaced vertically relative to said compressor and a motor means for driving said compressor also being mounted in said casing.

4,132,089

TRANSMISSION OF MOVEMENT TO A UNIT MOUNTED ON A ROTATABLE CARRIER

Alexander Skinner, Southampton, and Ronald G. T. Cook, Fareham, both of England, assignors to Plessey Handel und Investments AG, Zug, Switzerland

Filed Jun. 8, 1976, Ser. No. 693,860

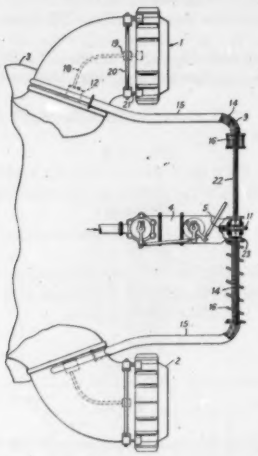
Claims priority, application United Kingdom, Jan. 10, 1976, 908/76

Int. Cl.[2] F16C *1/02*

U.S. Cl. 64—2 R **8 Claims**

1. Apparatus for the transmission of movement from the rotary output element of a unit actuator forming part of a six structure to a unit-driven mechanism mounted on a carrier of at least one vectorised-thrust nozzle for use in an aircraft, having means for adjustably swivelling said nozzle about the swivel axles relative to the fixed structure to vary the thrust angle of the nozzle, and means for nozzle-area control operatively connected to the unit-drive mechanism for operation by said mechanism to vary the effective area of the nozzle, which apparatus comprises a flexible drive shaft operatively connected to the unit drive of said vectorised-thrust nozzle carrier, and means operatively connecting the output element of such unit actuator to said flexible drive shaft so as to rotate said shaft relative to the unit drive mechanism of said vectorised-thrust nozzle carrier by an amount proportional to the rotation of the

output element of said unit actuator at a rate of rotation relative to the vectorised-thrust nozzle carrier which is unaffected



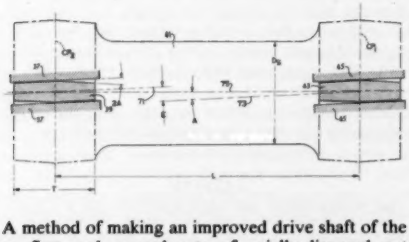
by any rotation of the vectorised-thrust nozzle carrier relative to the fixed structure.

4,132,090

CROWNED INVOLUTE SPLINES AND METHOD OF MAKING

Hugh L. McDermott, Edina, Minn., assignor to Eaton Corporation, Cleveland, Ohio

Filed Apr. 29, 1977, Ser. No. 792,170
Int. Cl.[2] F16D *3/18*; B23F *5/22, 9/08*
U.S. Cl. 64—9 R **12 Claims**



1. A method of making an improved drive shaft of the type having first and second sets of axially-disposed external crowned splines for transmitting torque between first and second sets of internal straight splines; the sets of internal straight splines defining an eccentricity E; each of the sets of external crowned splines defining a central plane oriented generally perpendicular to the axis of said shaft; said shaft defining an axial length L between said first and second central planes and a running angle A wherein A = arcsin E/L; each of said external splines having a primary pressure angle ϕ_S and being crowned an amount sufficient to provide a clearance X between the external spline and the adjacent internal spline at any given axial distance Y along the external spline from the central plane, the clearance X and distance Y being related by the equation X = Y tan A, the method comprising: providing a hob cutter having cutter teeth with a pressure angle ϕ_H, wherein ϕ_H is greater than ϕ_S; rotating said hob cutter to effect hobbing of said splines; simultaneously with the preceding step feeding said hob cutter along the length of said external splines, the axis of said hob cutter following a path defined by a variable dimension Z, Z being the radially inward movement of the hob cutter axis from a reference line toward the axis of said shaft and conforming to the following equation:

$$Z = Y \tan A / \sin \phi_H .$$

2. The improved drive shaft made by the method of claim 1.

4,132,091

SELF LOCKING FUEL CAP

Ernesto M. Aro, Wilmington, and Donald J. Shanklin, Fullerton, both of Calif., assignors to Orion Industries, Compton, Calif.

Filed Sep. 23, 1977, Ser. No. 836,043
Int. Cl.[2] B65D *55/14*
U.S. Cl. 70—165 **13 Claims**

1. A self locking vehicle fuel tank cap for use with an annular threaded fuel inlet comprising:

a cover having annular walls for encircling said fuel tank inlet in coaxial fashion and having a transverse enclosing end member extending thereacross and equippped at the interior surface thereof with a guideway defining a transverse path adjacent to said end member and intersecting the cover axis;

a transverse lug disposed for longitudinal movement in said guideway between a longitudinally displaced unstable unlocking position and a stable locking position;

resilient biasing means for driving said lug toward said stable locking position and having means for urging said lug from said unlocking to said locking position and means for opposing unaided movement of said lug from said unlocking to said locking position;

a central core assembly threaded for coaxial engagement with said fuel tank inlet and having transverse interiorally directed radial projection means extending from the perimeter thereof aligned for coaction with said lug, including first coaction means relative rotation of said lug and said projection means in one direction with said lug initially in said unlocking position causes said projection means to force said lug from said unstable unlocking position to said stable locking position thereby overcoming said means for opposing unaided movement; and including second coaction means

whereby relative rotation of said lug and said projection means in the opposite direction of rotation with said lug initially in said unlocking position causes said lug to engage said projection means for rotation therewith, and relative rotation of said lug and said projection means otherwise causes engagement therebetween for rotation together in only said one direction.

4,132,092

PROTECTIVE COVER FOR A HANDLE LOCK

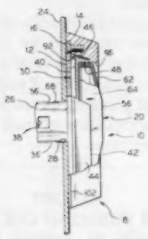
Robert L. Steinbach, Chicago, Ill., assignor to Chicago Lock Co., Chicago, Ill.

Filed Apr. 18, 1978, Ser. No. 897,335
Int. Cl.[2] E05B *13/00*
U.S. Cl. 70—208 **16 Claims**

1. A protective cover for a handle lock, said lock including a handle housing adapted to be mounted on a closure and having a tubular receptacle which extends into the closure when mounted, a flange projecting laterally outwardly from the receptacle for supporting the housing thereby on the outer

surface of the closure, and means cooperative with fastening means for securing the housing to the closure; a closure handle having a stem received in said receptacle and a grip on the outer end of the stem for manual operation of the handle, said handle being movable inwardly and outwardly with respect to said housing between an inner locked position wherein the grip is adjacent to said flange and an outer operating position; and locking means carried by said handle and cooperative in said locked position with means on said housing for locking the handle to the housing, said cover comprising:

a mounting plate having an opening for receiving said receptacle extending therethrough when the cover is in use with the lock mounted on a closure, with the plate engaging the inner surface of said flange to secure the plate to the closure;



a one-piece casing adapted to be mounted on said plate in said use to continuously surround said flange and said grip in said locked position, said casing having a handle-movement opening access to said locking means in said locked position and permitting movement of said handle between said locked and operating positions, said grip being disposed outwardly of said casing in said operating position, said casing also being adapted to lie closely adjacent to said grip around the periphery of said handle-movement opening in said locked position for preventing insertion and operation of a prying tool behind said grip; and

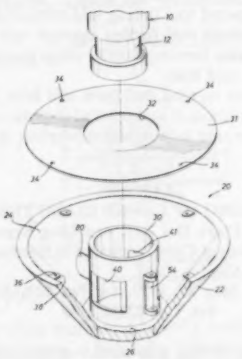
means for rigidly connecting said casing to said plate.

4,132,093

SECURITY DEVICE FOR TRAILER COUPLING PIN

Robert L. McDorman, Sr., P.O. Box 473, La Porte, Tex. 77571

Filed Aug. 18, 1977, Ser. No. 825,823
Int. Cl.² E05B *65/12*
U.S. Cl. 70—231 **4 Claims**



1. A security device adapted for locking engagement over the coupling pin of the trailer of a tractor-trailer rig comprising:

a truncated conical housing having a solid base at its tapered end;

a sleeve secured to the inside surface of said base and extending therefrom for substantially the height of said housing, said sleeve having an inside diameter larger than the outside diameter of the coupling pin to be covered to provide a sliding fit between the sleeve and the coupling pin, said sleeve having a pair of opposed horizontal slots intermediate its length;

a pair of jaw elements adapted to fit within said slots and providing opposed locking surfaces on their lower faces when fully inserted into said slots, said jaw elements having upper cam surfaces for engaging the coupling pin as it is inserted into said sleeve for camming the jaw elements outwardly during such insertion;

means for biasing said jaw elements into said slots comprising pivotally mounted jaw carriers substantially surrounding said sleeve and secured to said jaw elements and resilient means for urging said jaw carriers inwardly;

a lock recessed in the sidewall of said housing and having rotatable cam elements operable to engage mating surfaces on said jaw carriers to urge said jaw carriers outwardly against the bias of said resilient means; and

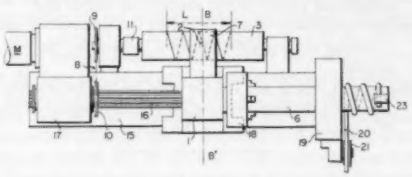
a cover plate detachably secured to the larger end of said conical housing and having a central opening for passing the coupling pin.

4,132,094

MACHINE FOR FORMING HELICOIDAL SPRINGS

Jean L. Missioux, 55 Boulevard Gambetta, 95110 Sannois, France

Filed Jul. 8, 1977, Ser. No. 813,982
Claims priority, application France, Jul. 9, 1976, 76 21097
Int. Cl.² B21F *3/04*
U.S. Cl. 72—7 **12 Claims**



1. A machine for making helicoidal springs heated or cooled comprising a rotating mandrel, around which a wire for forming a spring is wound, a motor rotating said mandrel, a movable carriage, a broach carried by said carriage and supporting said mandrel for longitudinal displacement of said mandrel, a drive screw engaging said carriage, a motor driving said drive screw, means for guiding the wire to be wound on said mandrel, a photoelectric scanner with a rotating beam mounted on a lateral extension of said movable carriage, a rotating cylinder, a helicoidal trace corresponding to the helix of the spring to be manufactured on said rotating cylinder, said scanner being above and oriented in the direction of said rotating cylinder, said mandrel being drivingly associated with said rotating cylinder, and said scanner controlling said motor driving said drive screw and thus controlling the longitudinal displacement of said carriage.

4,132,095

AUTOMATIC GAUGE CONTROL METHOD AND APPARATUS FOR TANDEM STRIP MILLS

Richard J. Bowman, Middletown Township, Bucks County, Pa., assignor to United States Steel Corporation, Del.

Filed Aug. 4, 1977, Ser. No. 821,888
Int. Cl.² B21B *37/08*; H03K *25/02*
U.S. Cl. 72—8 **16 Claims**

1. In a tandem strip mill which includes a plurality of roll stands, each of said stands comprising:

a respective pair of work rolls having a gap therebetween through which a strip passes during a rolling operation,

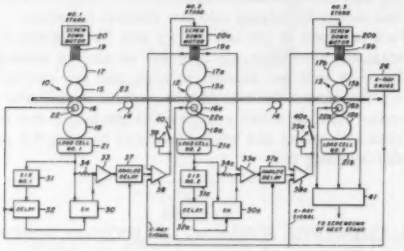
the presence of the strip between the rolls producing a separating force on the rolls, which force varies with characteristics of the strip;

respective means for adjusting the relative position of the rolls and the size of gap therebetween; and

respective means for measuring the separating force;

the combination therewith of an improved automatic gauge control apparatus comprising:

means operatively connected with the force-measuring means of one or more of said stands for generating and feeding-forward to a succeeding stand signals representing gap-error exclusively as indicated by changes in the separating force;



the means for feeding gap-error signals forward including means for delaying the signals to allow for transport time of the strip from the stand at which the force is measured to the succeeding stand, minus the reaction time of the adjustment means of the succeeding stand; and

means operatively connected with the succeeding stand for operating the adjustment means thereof in response to the signals;

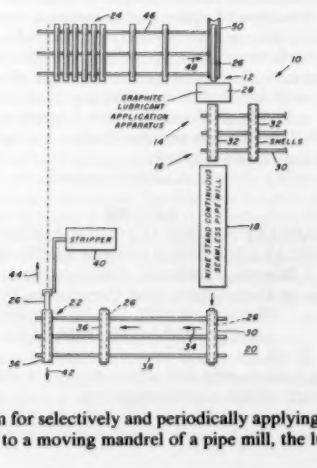
the signals which are fed-forward to the succeeding stand providing the exclusive means effecting adjustments made in response to changes in the separating force.

4,132,096

GRAPHITE LUBRICANT APPLICATION APPARATUS AND METHOD

John J. Seaton, Greentree Borough, and James K. Slagle, Washington Township, Westmoreland County, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Oct. 7, 1976, Ser. No. 730,410
Int. Cl.[2] B21B *43/02*
U.S. Cl. 72—21 **11 Claims**



1. A system for selectively and periodically applying a lubricant mixture to a moving mandrel of a pipe mill, the lubricant mixture having a propensity to clog said system, said application system comprising:

means for pumping such lubricant mixture from a source of such lubricant mixture;

means for spraying such lubricant mixture at such moving mandrel;

means for conducting such lubricant mixture from said pumping means to said spraying means;

means for selectively and automatically switching said application system on for applying said lubricant mixture to such mandrel when such mandrel approaches a given point relative to said application system and off when such mandrel is moved away from another given point relative to said system; and

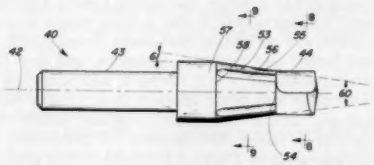
means for cleaning said application system of such lubricant mixture when said system is not applying such lubricant mixture to a mandrel for at least a given period of time, thereby preventing clogging of said system by such lubricant mixture, said cleaning means leaving said system in a condition for reapplication of such lubricant mixture subsequent to its operation.

4,132,097

METHOD FOR FORMING COLLARED HOLES

Ward A. Ames, Danville, Ill., assignor to Tridan Tool & Machine, Inc., Danville, Ill.

Filed Nov. 3, 1977, Ser. No. 848,328
Int. Cl.[2] B21D *51/38*
U.S. Cl. 72—71 **3 Claims**



1. A method of forming a collared hole comprising the steps of:

forming a hole in a workpiece;

inserting a tapered tool into said hole wherein said tool is of sufficient size and taper to interferingly engage said workpiece at said hole;

contacting said tapered tool against said workpiece around the perimeter of said hole;

rotating said tapered tool during said contacting step;

forcing said tapered tool further through said hole during said rotating step forming a collar integral with said workpiece around said hole;

withdrawing said tapered tool from said hole; and

reversing the rotation of said tapered tool during said rotating step when said hole in said workpiece is noncircular.

4,132,098

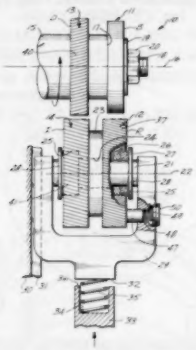
COLD-ROLLING OF LARGE DIAMETER GEARS

Irven H. Culver, Playa Del Rey, and Oleg Szymber, Rancho Palos Verdes, both of Calif., assignors to Southwestern Industries, Inc., Los Angeles, Calif.

Filed May 27, 1977, Ser. No. 801,110
Int. Cl.[2] B21H *5/02*
U.S. Cl. 72—102 **10 Claims**

1. Apparatus for rolling gear teeth in a rotatable metal gear blank by forceful engagement of the blank by an appropriately profiled forming roll, the apparatus comprising mounting means for mounting the blank and the roll for rotation about first and second axes, respectively, means coupled to one of the blank and the roll adapting the same to be rotated about its axis, drive means coupled to one of the axes for moving the one axis in a translatory manner relative to the other axis during rota-

tion of the one of the blank and the roll to move the blank and the roll into engagement with each other sufficiently forcefully to cause the roll to form gear teeth in the blank, and gear means coupled between the blank and the roll for rotating the blank and the roll about the respective axes in response to rotation of the one of the blank and the roll, the gear means comprising a



first gear affixed to the blank for rotation with the blank about the first axis, and a second gear affixed to the roll for rotation with the roll about the second axis and for meshing with the first gear, the teeth on the first and second gears being cooperatively defined so that the ratio of the angular velocities of the gears about their respective axes is constant during meshing of the gears independently of the distance between the axes.

4,132,099

FOUR-ROLLER WORKPIECE BENDING MACHINE

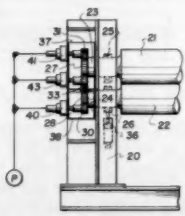
Fritz Elsener, Nenzlingen, Switzerland, assignor to Chr. Hausler AG, Switzerland

Continuation-in-part of Ser. No. 754,038, Dec. 23, 1976, abandoned. This application Nov. 16, 1977, Ser. No. 851,848

Claims priority, application Switzerland, Jan. 29, 1976, 1102/70

Int. Cl.² B21D *5/08*

U.S. Cl. 72—175 **4 Claims**



1. A four-roller workpiece bending machine comprising, in combination: a frame, a first roller rotatably supported by said frame; a second roller rotatably supported by said frame and disposed below said first roller to cooperate therewith; a gear-wheel provided on said first roller to be rotatable therewith; at least two pinions meshing with said gear wheel; a respective pressure-fluid operable motor for each pinion, having a shaft mounting the associated pinion; and common pump means connected to all said motors to supply pressure-fluid thereto.

4,132,100

HAND-OPERATED TOOL FOR BENDING PIPES

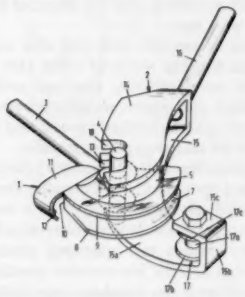
Jacob P. Schuler, Kerkpad N.Z. 43, Soest, Netherlands

Filed Apr. 5, 1977, Ser. No. 784,822

Claims priority, application Netherlands, Apr. 7, 1976, 7603646; Mar. 18, 1977, 7702977

Int. Cl.² B21D *7/02*

U.S. Cl. 72—217 **30 Claims**



1. A pipe bender for bending pipes, first and second pivotally interconnected levers, a pivot pin fixed to the first lever, and a circular segment coaxial therewith, which segment defines the inside bend of a pipe to be bent, a slot disposed in the circular peripheral portion of the circular segment, a first outer support for the pipe to be bent, spaced apart therefrom and positioned adjacent a circumferential end of the circular segment; and having at the second lever a fork having two arms which receive said pivot pin, and a second outer support for the pipe to be bent coupled to the second lever, one of the two fork arms being extended relative to the other fork arm, and carrying at the free end of its arm extension the second outer support, said arm extension being bent so that, in the direction of the free end of said extension has a receding configuration relative to the direction that is opposite to the direction of the bending operation; and the second outer support being spaced apart from the pivot pin in the order of at least the diameter of the pipe to be bent and the radius of the circular segment.

4,132,101

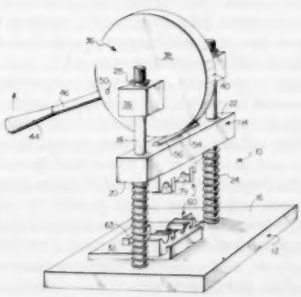
CRIMPING APPARATUS

Joseph O. Abramson, 5629 Edgewater Dr., Orlando, Fla. 32810

Filed Aug. 31, 1977, Ser. No. 829,178

Int. Cl.² B21D *37/12*

U.S. Cl. 72—324 **13 Claims**



1. Apparatus for attaching a metallic sleeve to a multi-strand electrically conductive cable, comprising:

a base member;

a platen member disposed above said base member and movable relatively thereto;

a pair of opposed working jaw members, one of which is attached to said platen member and the other of which is attached to said base member;

operating means for moving said platen member and its attached jaw member toward said base member and its attached jaw member;

said operating means including:

a rotatable disc member;

means eccentrically mounting said disc member for rotation about an offset axis; and

engagement means connected with said disc member for rotating said disc member about its offset axis;

said rotatable disc member being disposed with its edge engageable against said platen member to act as a cam which moves said platen member toward said base member by operation of said engagement means;

said working jaw members each including a crimping recess;

said apparatus being operative, when metallic sleeve for the multi-strand electrically conductive cable is inserted into the crimping recess on the jaw member attached to the base member, by causing said operating means to move said platen member and the jaw member attached thereto downwardly until such jaw member contacts the metallic sleeve and deforms the same into a crimped portion which engages tightly against the strands of the electrically conductive cable.

4,132,102

MACHINE TO WORK SHEET MATERIAL

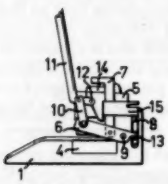
René Bornand, 34, chemin de Beaulieu, Bienne, Berne, Switzerland (CH-2500)

Filed Aug. 9, 1977, Ser. No. 823,091

Claims priority, application Switzerland, Aug. 16, 1976, 10379/76

Int. Cl.² B21D *37/00*

U.S. Cl. 72—324 **1 Claim**



1. A machine including a frame for working sheet material comprising a base including two parallel parts having a slot therebetween, a side piece extending upwardly from each base part, said side pieces providing a space between them, a lower knife secured to one of said base parts and disposed within said slot, an upper knife pivoted at one end to said side pieces, a lever pivoted at one end to said frame and pivotally connected at its other end to one end of said upper knife, said lever extending angularly upwardly from said base when in its inoperative position, a folding tool guided on said frame for vertical movement and pivoted at its lower end to said upper knife between the opposite ends thereof, a guide member mounted on said frame and having a slot parallel to said base and a vertical bore beneath said slot, a punching tool slidable in said bore, said upper knife having an extension at its end pivoted to the side pieces, said extension engaging said punching tool whereby when said lever is moved downwardly said upper and lower knives are moved together to produce a shearing effect on a sheet of material between said knives said folding tool is pulled downwardly by said upper knife to exert a folding effect on a sheet of material in its downward path and said punching tool is moved upwardly by said extension on the upper knife to punch a hole in a sheet of material in the path of its upward movement.

4,132,103

METHOD OF PRODUCING AN ANNULAR PART FOR USE AS A DIAPHRAGM

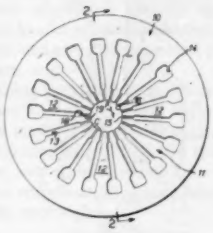
Raymond Le Brise, Montmorency, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Aug. 3, 1977, Ser. No. 821,496

Claims priority, application France, Aug. 9, 1976, 76 24247

Int. Cl.² B21D *28/00*

U.S. Cl. 72—326 **35 Claims**



1. A process for producing an annular part such as a clutch diaphragm from a blank wherein the part comprises a peripheral portion which is circularly continuous and forms a resilient washer of the Belleville washer type, and a central portion circularly fragmented into radial segments by slots each of which extends radially from a blind end adjacent the said peripheral portion to an open end by which it leads into a central aperture common to all the said slots, wherein over at least part of the length of a slot, including the open end of the latter, the two edges of the slot are formed in two separate operations, these being a first cutting operation in the course of which one of the edges is formed, and a second cutting operation in the course of which the other edge is formed.

4,132,104

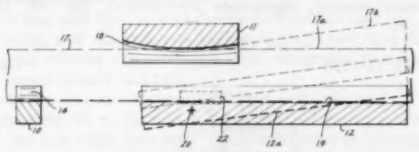
METHOD AND APPARATUS FOR BENDING COATED PIPE INCLUDING HEATING THE PIPE COATING BY RESISTANCE HEATING

Edward A. Clavin, Houston, Tex., assignor to Midcon Pipeline Equipment Co., Houston, Tex.

Continuation-in-part of Ser. No. 735,182, Oct. 26, 1976, abandoned. This application Mar. 15, 1978, Ser. No. 886,631

Int. Cl.² B21D *7/16*

U.S. Cl. 72—342 **24 Claims**



1. Method for bending pipe having a coating of heat-softenable material bonded to its exterior surface in a pipe bending machine of the type having a downwardly facing bending die and an upwardly facing pin up shoe and an upwardly facing strongback, comprising placing an electrical resistance heater over an area of the strongback extending longitudinally of the strongback at least between the downward projections through the bend axis of the pipe of the ends of the longitudinal extent of the bending die which is engaged by the pipe during formation of a maximal bend in the pipe and extending laterally of the strongback at least about sixty degrees around the pipe to each side of the longitudinal botton centerline of the pipe, disposing a pipe to be bent in the bending machine between the bending die and the pinup shoe and strongback, operating the electrical resistance heater to heat and soften the area of the pipe coating corresponding thereto, and operating the pipe

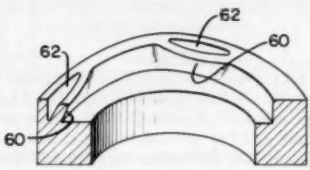
bending machine to pivotally move the strongback to force the pipe against the bending die over said longitudinal extent thereof to form a bend in the pipe, the coating stretching at said heated and softened area thereof whereby the coating is not damaged as said bend in the pipe is formed.

4,132,105

METHOD OF MAKING A LOCKING COLLAR FOR AN ANTIFRICTION BEARING ASSEMBLY

Eli M. Ladin, Ann Arbor, Mich., assignor to Federal-Mogul Corporation, Detroit, Mich.

Filed Oct. 12, 1977, Ser. No. 841,508
Int. Cl.[2] B21D *22/00*
U.S. Cl. 72—356 **10 Claims**



1. A method for making an internal conical surface on the counterbore of an antifriction bearing locking collar in a press containing a die with a spring-loaded, knock-out and locating pin that is generally concentric with the axis of the die and protruding above the surface of the die comprising the steps of:

(a) placing the locking collar in the press with the counterbore side facing downwardly and positioned by the bore on the spring-loaded knock-out and locator pin of the die;

(b) closing the press on the locking collar to further compress the loading spring under the knock-out and locator pin by moving said pin and said collar axially downwardly and forcing the counterbore of said locking collar into inwardly angled and confining sides of said die to thereby deform the counterbore radially inwardly at least at preselected positions such that the deformed portion generally conforms with the internal configuration of corresponding portions of the confining sides of the die; and

(c) opening said press allowing the compressed spring of the knock-out and locator pin to expand, pushing the pin upward and disengaging the locking collar from the die.

4,132,106

METHOD FOR BENDING WIRE OR STRIP MATERIAL INTO ROUND PARTS

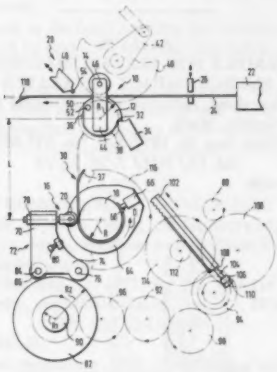
Otto Bihler, Schleiferweg 2, Halblech near Fussen, Fed. Rep. of Germany (8959)

Filed May 9, 1977, Ser. No. 795,164
Claims priority, application Fed. Rep. of Germany, May 11, 1976, 2620768
Int. Cl.[2] B21D *7/04, 9/05;* B21F *37/00*
U.S. Cl. 72—384 **7 Claims**

1. A method of making a plurality of curved shapes of predetermined length from respective, longitudinally sequential sections of an elongated piece of material having an initial free, leading end of arcuately bent shape in a sequence of repetitive cycles, each cycle comprising the steps of:

(a) draping a longitudinal section of said piece spaced from said free end a distance approximately equal to said predetermined length over a first mandrel until said free end engages a second mandrel, and thereby arcuately bending said section;

(b) securing said free end to said second mandrel; (c) transversely cutting the bent section while backed by said first mandrel, and thereby severing a newly formed, arcuately bent, free end of said continuous piece of material from a blank secured to said second mandrel by said initial free end and further including an arcuately bent trailing end and a portion intermediate said ends; and



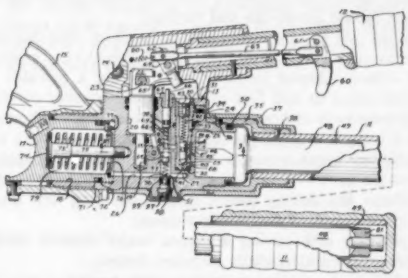
(d) draping said intermediate portion about said second mandrel while keeping said initial free end secured to said second mandrel.

4,132,107

HYDRAULIC COMPRESSION TOOL

Yasuo Suganuma, and Toshio Izumi, both of Nagano, Japan, assignors to Izumi Products Company, Elk Grove Village, Ill.

Filed Jun. 24, 1977, Ser. No. 809,608
Int. Cl.[2] B21D *7/06*
U.S. Cl. 72—416 **11 Claims**



1. In a hydraulic compression tool for compressing a connector onto a wire end, said tool including a pair of complementary compression dies, means defining a reservoir for holding a supply of hydraulic fluid, a hydraulic force applying means for forcibly urging the dies toward a compressing disposition, a hydraulic pump for delivering hydraulic fluid from said supply under pressure to said force applying means to effect a compressing operation, and means for returning hydraulic fluid from said force applying means to said reservoir to release said dies subsequent to a compression operation, the improvement comprising:

means defining a relief flow passage from said force applying means;

body means defining an outwardly opening cavity communicating with said relief flow passage and having an outlet opening to said reservoir; and

valve means readily removably installed in said cavity for controlledly closing said relief flow passage while permitting flow of said hydraulic fluid from said force applying means to said supply means when the pressure of the hydraulic fluid in said force applying means exceeds a preselected maximum operating pressure, said valve means defining a transverse passage opening to said outlet and said means for returning hydraulic fluid to said reser-

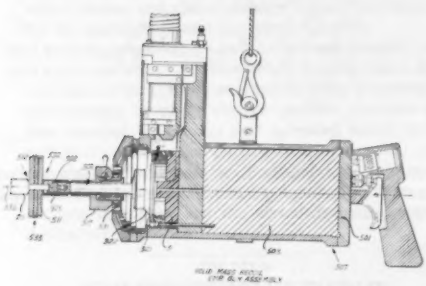
voir includes means for directing the returning fluid through said transverse passage and said outlet to said reservoir.

4,132,108

RAM ASSEMBLY FOR ELECTROMAGNETIC HIGH ENERGY IMPACT APPARATUS

Franciscus Hogenhout, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 28, 1977, Ser. No. 837,487
Int. Cl.[2] B21J *7/30, 15/24*
U.S. Cl. 72—430 **2 Claims**



1. A ram assembly for use in an electromagnetic work tool, said ram assembly comprising:

a tubular shaped ram shaft having a flange-like end portion, said end portion having a first predetermined number of holes therein equiangularly disposed about the circumference of said flange-like end portion;

a driving disk and a cylinder-shaped insulator plug disposed between said driving disk and said flange-like end portion;

said cylinder-shaped insulator plug having a plurality of holes equal to said first predetermined number of holes equiangularly disposed about the circumference thereof;

said driving disk having a first major surface abutting said cylinder-shaped insulator plug, said first major surface being a centrally located cavity of cylindrically shaped volume for seating therewithin an abutting first major surface region of said insulator plug;

said driving disk having a second major surface with a groove circumferentially disposed therein;

a disk-shaped conductive driving plate having a working surface and a first major surface opposite said working surface, said first major surface having a circumferentially disposed ring-like portion protruding therefrom a predetermined distance equal to about the depth of said groove so as to seat therein, thereby providing flush mating of said second major surface of said driving disk with said first major surface of said conductive driving plate;

a further predetermined number of roll pins extending through a corresponding further predetermined number of equiangularly disposed radially extending holes disposed in the outer circumferential surface of said driving disk and further through a matching corresponding further predetermined number of holes extending radially through said ring-like portion of said first major surface of said disk-shaped conductive driving plate;

half of said number of holes in said cylinder-shaped insulator plug disposed for receiving heads of a first set of screws which are secured in mating juxtaposed ones of said predetermined number of holes equiangularly disposed about the circumference of said flange-like end portion of said tubular-shaped ram shaft; and,

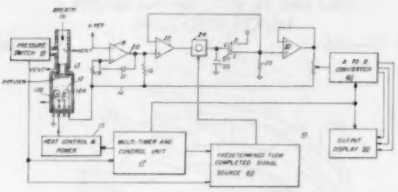
the remaining half of said number of holes in said cylinder-shaped insulator plug disposed for receiving the heads of a second set of screws which are secured in mating juxtaposed holes equiangularly disposed in the bottom surface of said centrally located cavity.

4,132,109

BREATH TESTING SYSTEM

Gary L. VanderSyde, Naperville, Ill., assignor to Alcohol Countermeasure Systems, Inc., Sarnia, Canada

Filed Jul. 22, 1977, Ser. No. 818,283
Int. Cl.[2] G01N *27/14*
U.S. Cl. 73—23 **3 Claims**



1. In a breath tester of the type wherein a subject blows breath into an input for a predetermined continuous and uninterrupted flow, which breath is exposed to an electronic detector whose output signal is representative of the alcohol present in the breath and which detector, if subject to continued exposure of additional breath after the predetermined flow, is prone to produce an erroneous output, the improvement comprising:

circuit means for holding a signal coupled to the detector and responsive thereto;

electronic circuit means, responsive to the sensed completion of a preselected flow for isolating said signal holding circuit means from the detector at the completion of the preselected flow; and

means responsive to the stored signal for providing an output indicative of the sensed alcohol in the breath;

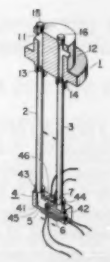
whereby continuous exposure of breath to detector after the completing of the predetermined breath flow does not effect the output of the tester.

4,132,110

VIBRATION TYPE LIQUID DENSITY METER

Setsuo Muramoto, Musashino, Japan, assignor to Kabushikikaisha Yokogawa Denki Seisakusho, Tokyo, Japan

Filed Jul. 5, 1977, Ser. No. 812,764
Claims priority, application Japan, Jul. 20, 1976, 51-96313
Int. Cl.[2] G01N *9/00*
U.S. Cl. 73—32 A **7 Claims**



1. A liquid density meter comprising

(A) a base having a passageway for flow of liquid to be measured;

(B) a pair of hollow, cylindrical, elongated pipes of substantially similar measurements and physical properties, disposed substantially parallel to each other;

(C) a connector having a passageway therein for flow of said

liquid, and being of a mass substantially smaller than said base;

(D) means for connecting one end of each pipe to said base in communication with said passageway therein;

(E) means for connecting the other end of each pipe to said connector in communication with said passageway therein;

(F) piezoelectric means attached to said connector for applying a force substantially perpendicular to said pipes for causing deformation of said connector and the oscillation of said pipes; and

(G) means for detecting the said oscillations of said pipes, wherein said detecting means includes a temperature detector disposed within said connector, and circuit means for compensating the detected oscillation frequency in relation to density of the liquid for temperature.

4,132,111

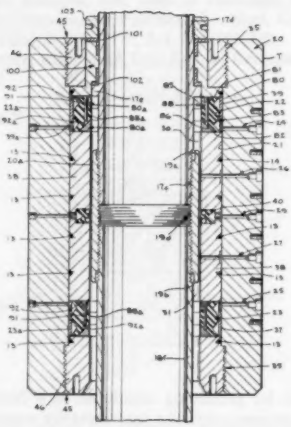
LEAK TESTING METHOD AND APPARATUS FOR TUBULAR MEMBERS PACKER MEANS THEREFOR

Malvern M. Hasha, 1527 Castlerock, Houston, Tex. 77090

Continuation-in-part of Ser. No. 467,133, May 6, 1974, abandoned. This application Sep. 16, 1974, Ser. No. 506,547

Int. Cl.[2] G01M *3/28*; E21B *33/126*

U.S. Cl. 73—46 **6 Claims**



1. A testing apparatus for externally testing a connection means between tubular members comprising:

A body having longitudinal opening through which said tubular members and connection may extend;

removable spacer means positioned in the wall of the body opening in stationary relationship and having an opening of preselected size extending longitudinally therethrough and providing longitudinally spaced annular grooves;

radially movable first and second annular seal means positioned in the grooves formed by the spacer means and disposed on opposite sides of the connection;

back-up means mounted on said first and second annular seal means and movable radially therewith for engaging the tubular members;

said body having passage means therein for conducting a pressurized actuating fluid to move said seal means and back-up means radially inwardly of said body to seal against the tubular members and seal off the connection between said seal means;

said body having additional passage means for conducting a pressurized test fluid to externally test the connection means sealed off between said seal means;

means to secure said stationary spacer means and seal means in the body opening;

means for detecting pressure decline of the test fluid to thereby indicate leakage past the connection;

one of said tubular members including an annular enlargement thereon;

bearing means in the body opening for the tubular member;

means carried by said body to retain said bearing in position; and

removable means carried by the tubular member which cooperate with said enlargement and bearing means to inhibit longitudinal movement of the tubular member.

4,132,112

PRESSURE-MEASURING SHEET

Noriyuki Hosoi; Yasuhiro Ogata, and Hiroharu Matsukawa, all of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 12, 1977, Ser. No. 824,126

Claims priority, application Japan, Aug. 12, 1976, 51-96678

Int. Cl.[2] G01L *1/00*

U.S. Cl. 73—141 R **24 Claims**

1. A pressure-measuring sheet comprising a support having thereon a layer or a mixture of at least a first group and a second group of microcapsules, each of said groups of microcapsules containing electron-donating color former capable of forming a color on and a color developer on said support containing microcapsules or on a separate support wherein

(1) said first group of microcapsules has a δ/D ratio of about 5×10^{-3} to about 5×10^{-2}, wherein δ is the number average microcapsules wall thickness of the microcapsules and D is the volume avarage particle size of the mircapsules and

(2) said second group of microcapsules has a δ/D ratio of about 1×10^{-2} to about 1×10^{-1}, and with the Ps value difference between the first group of microcapsules and the second group of microcapsules being about 50 to about 1,000 kg/cm^2 where Ps is the lowest pressure at which no further color density is formed by the color former with a color developer.

4,132,113

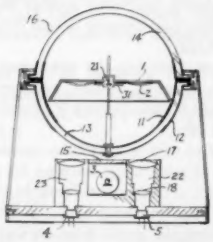
NAVIGATION DEVICES

Harold T. Lyman, Jr., Milford, Conn., assignor to Questech, Inc., Hamden, Conn., a part interest

Filed Feb. 16, 1977, Ser. No. 769,409

Int. Cl.[2] G01C *21/00*

U.S. Cl. 73—178 R **23 Claims**



1. Means for obtaining voltages proportional to the sine and cosine of the angle between the zero angle reference line on a rotatable card or dial and a fixed external reference line, said means consisting of a prescribed variable density optical pattern on the card or dial, said pattern having an angular density relation expressed by the equation

$$D = K\cos^2(\theta/2) = (K/2)(1+\cos\theta)$$

where K is a constant of proportionality and θ is the angle referenced to the darkest density angle, a light source illuminating the card or dial, orthogonal pairs of photo-sensors

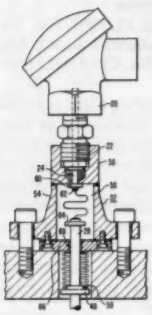
connected in circuit so as to balance out constant voltages due to diffuse or background illumination or unavoidable minimum pattern density and yielding output voltages proportional to the sine and cosine of the above said angle.

4,132,114

TEMPERATURE PROBE ASSEMBLY FOR GAS TURBINE ENGINE

Chandra C. Shah, Broomall, and James A. Laurelli, Springfield, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 14, 1977, Ser. No. 777,259
Int. Cl.[2] G01K *7/02*
U.S. Cl. 73—343 R **7 Claims**



1. A temperature probe assembly for a gas turbine engine having an outer casing housing the turbine and an internal casing through which the probe must extend, said assembly comprising:

a thermocouple tip for sensing the temperature of a critical region of the gas turbine interiorly of said internal casing and lead wires extending from said tip through apertures in said internal and outer casing, to a probe head exteriorly of said outer casing;

a flange member having an opening therethrough for alignment with said aperture in said outer casing;

a first tube member enclosing a length of said lead wires and extending through said casing apertures to within said opening in said flange;

a second tube member enclosing another length of the lead wires from within said opening in said flange to internally of said probe head;

an upper member covering the outer end of said flange opening, said member having an aperture generally smaller than said flange opening for receipt therethrough of said second tube;

a collar attached to said second tube member adjacent the end interiorly of said flange opening for preventing outward movement of said second tube beyond the engagement of said collar with said upper member;

means for mounting the probe head on said upper member and receiving said second tube therethrough;

a retaining plate removably attached to said flange member to cover the inner end of said opening and defining an aperture therethrough in alignment with said opening, said aperture being smaller than said opening but large enough for receipt of said first tube;

a collar member attached to said first tube adjacent the end thereof interiorly of said flange opening for preventing movement of said first tube outwardly of said opening beyond the engagement of said collar member with said retaining plate, whereby the maximum separation of the adjacent ends of said first and second tubes interiorly of said flange opening occurs when said collar member and collar abut said retaining plate and said upper member respectively; and,

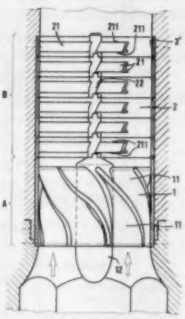
means externally of said flange opening for biasing said first tube outwardly of said opening to produce abutment of said collar member with said retaining plate, said lead wires having an excessive length forming a slack configuration in said flange opening when said tube ends are at their greatest separation whereby said wires remain free of any tensile stress or force transmitting condition.

4,132,115

DEVICE FOR PRODUCING CONDITIONS IN A FLOWING MEDIUM, ESPECIALLY IN A NUCLEAR REACTOR, PERMITTING MEASUREMENT OF A REPRESENTATIVE TEMPERATURE

Annelie Benemann, Bergisch Gladbach; Norbert Schult, Much (Siegkreis); Peter Voj, Rösenrath, and Bernhard Hosemann, Berlin, all of Germany, assignors to INTERATOM, Internationale Atomreaktorbau GmbH, Bensberg, Germany

Filed Apr. 25, 1977, Ser. No. 790,469
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1976, 2619218
Int. Cl.[2] G01K *1/00*
U.S. Cl. 73—349 **19 Claims**



1. Device for producing conditions in a flowing medium permitting measurement of a representative temperature comprising a twist-producing stage and a twist-reducing stage disposed serially in flow direction of the flowing medium within the flow cross section thereof and upstream of a temperature measuring sensor, said twist-producing stage being formed of a twist member comprising a plurality of spatially curved guide plates.

4,132,116

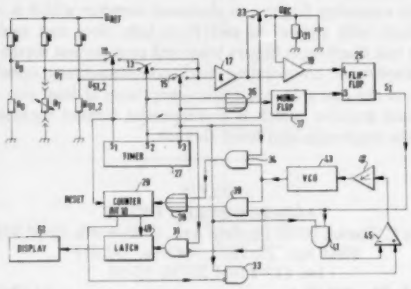
METHOD FOR LINEARIZING THE CHARACTERISTIC CURVE OF AN ELECTRONIC COMPONENT AND AN APPARATUS FOR IMPLEMENTING THE SAME

Helmut E. Zeeb, Kirchentellinsfurth, Fed. Rep. of Germany, assignor to Hewlett-Packard GmbH, Boblingen, Fed. Rep. of Germany

Filed Oct. 21, 1977, Ser. No. 844,327
Int. Cl.[2] G01N *7/24*
U.S. Cl. 73—362 AR **8 Claims**

1. A method for linearizing the exponential characteristic curve of an electronic component, in particular the temperature/resistance characteristic of a thermistor, said method comprising the steps of comparing the output value of a component with the output value of a passive resistance-reactance circuit varying exponentially with time and in the same sense

as the said characteristic; and measuring the time interval between a fixed starting moment, at which the exponential



variation is already taking place, and the moment when the two outputs reach equal values.

4,132,117

ULTRASONIC ENERGY RECEIVER PROBE UTILIZING OPTO-ELECTRICAL SENSING

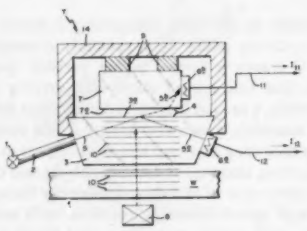
Erik Primbsch, Cologne, Fed. Rep. of Germany, assignor to Krautkramer-Branson, Incorporated, Stratford, Conn.

Filed Jun. 1, 1977, Ser. No. 802,320

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1976, 2646972

Int. Cl.² G01N *29/04*

U.S. Cl. 73—607 **23 Claims**



1. Transducer means for receiving ultrasonic energy and transforming such energy to an electrical signal comprising:

an optical prism;

means supporting said prism;

an optical interference means disposed opposite said prism;

means spacing said prism from said interference means to cause a gap with the respective oppositely disposed gap abutting surfaces separated by a distance in the order of 10^{-7} meter;

a layer of an intermediate medium having a lower index of refraction than that of said interference means filling said gap between said prism and said interference means;

a source of light spaced from said prism and coupled to said prism by light conducting means for causing a beam of light to enter said prism and be incident upon the gap abutting surface of said prism, causing a portion of said light beam to be reflected at said gap abutting surface of said prism and causing another portion of said beam to be transmitted through said intermediate medium into said interference means, and

photoelectric means coupled for sensing the variations of the light intensity of at least one beam portion responsive to ultrasonic wave energy transmitted to one of said abutting surfaces causing a periodic change in the thickness of said layer.

4,132,118

PISTON POWER GENERATING AND WORKING MACHINE

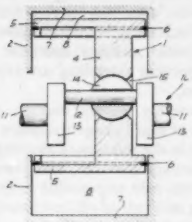
Ewald Harr, Heilbronner Strasse 19, Schwaigern 2, Germany (7103)

Filed Jan. 21, 1977, Ser. No. 761,009

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1976, 2602436; Mar. 16, 1976, 2610969

Int. Cl.² F16H *21/22*

U.S. Cl. 74—44 **18 Claims**



1. A piston power machine and piston working machine comprising a jacket enclosing at least one cylindrical generating chamber, at least one piston having a longitudinal axis and arranged in said generating chamber, said piston being reciprocatingly movable in the direction of said longitudinal axis and pivotally movable about said longitudinal axis, a rotatable shaft operatively associated with said piston, means connecting said piston and said shaft and responsive to the movement of said piston or the rotation of said shaft for converting, respectively, the piston motion into a rotational motion of said shaft or the rotational motion of said shaft into the piston motion, said motion converting means including a crankshaft having at least one shaft journal arranged at an angle to the direction of the reciprocating movement of said piston, said shaft journal having a longitudinal axis and being connected to said rotatable shaft, said crankshaft including a crankpin having two ends and a longitudinal axis, a crank web rigidly affixed at each end of said crankpin, said motion converting means further including a joint connecting said piston to said crankpin, said joint being movable along the longitudinal axis of said crankpin between said crank webs.

4,132,119

DERAILLEUR FOR A BICYCLE

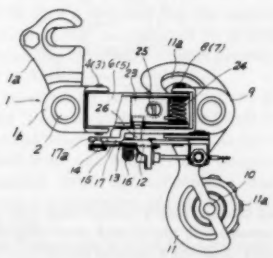
Masashi Nagano, and Hideaki Fujimoto, both of Sakai, Japan, assignors to Shimano Industrial Company Limited, Osaka, Japan

Filed Apr. 19, 1977, Ser. No. 788,824

Claims priority, application Japan, Apr. 30, 1976, 51-50682

Int. Cl.² F16H *7/22, 7/00*

U.S. Cl. 74—217 B **8 Claims**



1. A bicycle derailleur operated by a control cable having a wire and a sheath for changing the bicycle speed by position-

ing a chain on a selected one of a plurality of sprockets, comprising:

(a) four members, which include a base member, two linkage members pivoted to said base member, and a movable member pivoted to said linkage members and having cages carrying driving chain guide pulleys, said movable member being movable in reciprocation axially of the sprockets and with respect to said base member, one of said linkage members having an access hole therein,

(b) an L-shaped control member swingable independently from said four members having an arm onto which is mounted means for attaching thereto one of said wire and sheath of the control cable, an arm pivotally mounted to one of said movable member and base member, and an engageable projection extending toward one of said two linkage members,

(c) a pair of plates for storing energy, said plates being mounted to one of said linkage members to sandwich said linkage member in the relation of moving toward or away from said one linkage member, said plates being engaged therebetween with said engageable projection,

(d) a spring urging said pair of plates toward said one linkage member for storing energy, and

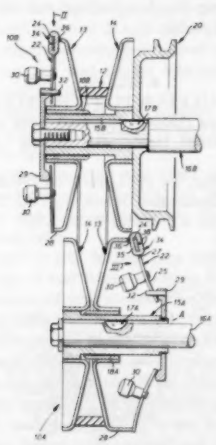
(e) a positioning and maintaining means provided between said control member and one of said four members to position and maintain the movable member with respect to the base member, said positioning and maintaining means comprising a retainer carrying a rolling body attached to said control member as a first cooperating means and an extension movable with one of said movable member and base member having a series of recesses therein as a second cooperating means which position said driving chain guide cages carried by said movable member.

4,132,120

DIAPHRAGM ENGAGEMENT MEANS FOR EXPANSIBLE PULLEY

Jean-Claude Fénart, Fourqueux (Yvelines), France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Mar. 31, 1977, Ser. No. 783,427
Claims priority, application France, Apr. 9, 1976, 76 10392
Int. Cl.[2] F16H *55/52, 55/56*
U.S. Cl. 74—230.17 A **26 Claims**



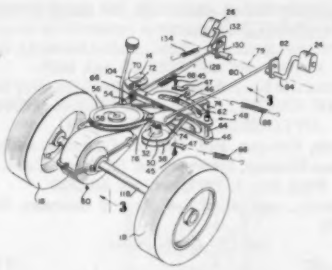
1. A speed change pulley comprising: two oppositely and coaxially disposed side plates each providing an inclined side surface thereby defining a tapered belt-receiving groove, one side plate being axially fixed and the other side plate being mounted for axial movement relative to the fixed side plate; a resilient return means engaging said movable side plate for movement thereof and comprising a diaphragm, the diaphragm including a peripheral portion providing a resilient Belleville washer type structure which bears against said movable side plate, and a central portion divided into a plurality of radially extending fingers; an abutment member which is axially fixed with respect to said fixed side plate and against which said diaphragm fingers bear; and engagement means on said diaphragm co-operating with complementary opening means in the movable side plate, comprising at least one engagement member which is a component formed separately from the diaphragm and fitted thereon.

4,132,121

VARIABLE SPEED DRIVE

George C. Clarke, 10509 Penfield Ave., Chatsworth, Calif. 91311

Filed Apr. 27, 1977, Ser. No. 791,227
Int. Cl.[2] F16H *55/56, 55/36*
U.S. Cl. 74—230.17 A **34 Claims**



1. A variable speed drive comprising a frame; a driving pulley and a driven pulley each rotatably mounted with respect to said frame; a double pulley variable speed sheave assembly; a first belt reeved about said driving pulley and sheave assembly; a second belt reeved about said driven pulley and sheave assembly; a cam arm having a cam surface; means for movably mounting said cam arm with respect to said frame; means for moving said sheave assembly along said cam surface to alter the drive ratio of said sheave assembly through a range of low to high speed operating positions with said first and second belts under driving tension; and biasing means for biasing said sheave assembly generally away from said driving and driven pulleys.

4,132,122

SHIFTABLE CHANGE SPEED TRANSMISSION UTILIZING IMPROVED BLOCKER AND JAW CLUTCH ASSEMBLY

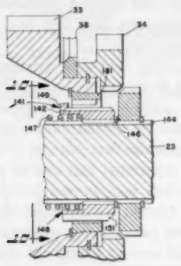
Elmer A. Richards, Kalamazoo, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 2, 1977, Ser. No. 802,693
Int. Cl.[2] F16H *3/38;* **F16D** *13/00*
U.S. Cl. 74—339 **22 Claims**

1. An improved shiftable change speed gear transmission system including a main shaft and at least one countershaft, multiple pairs of shiftable ratio gears arranged between said main shaft and said countershaft, jaw clutch devices comprising first and second jaw clutch elements for connecting at least one of at least some of said pairs of gears to one of said shafts and blockers associated with at least the jaw clutch device for engaging the low speed ratio gears for preventing engagement thereof in the event of a sensed nonsynchronous condition, the improvement comprising:

the blocker associated with the jaw clutch device for engaging the low speed ratio gears is effective to sense a first type of nonsynchronous condition wherein said first jaw clutch element overspeeds the second jaw clutch element

in a given direction of rotation but is ineffective to sense a second type of nonsynchronous condition wherein said



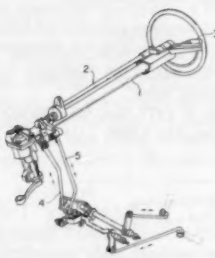
second jaw clutch element overspeeds the first jaw clutch element in said given direction of rotation.

4,132,123

REMOTE-CONTROL GEARSHIFT MECHANISM FOR VEHICULAR TRANSMISSION

Hakumi Ishii; Yoshitaka Sogo, and Shuichiro Ida, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 22, 1977, Ser. No. 809,042
Claims priority, application Japan, Jan. 22, 1977, 52/6234
Int. Cl.[2] G05G *9/16*
U.S. Cl. 74—473 SW **3 Claims**



1. In a remote-control gearshift mechanism for a vehicle of the type including

a control shaft extended in parallel with a steering column and movable in the axial direction and rotatable about its axis by a gearshift lever,

a linkage for transmitting the axial movement and rotation of said control shaft to a transmission,

a first spring loaded over the lower portion of said control shaft for normally biasing said control shaft upward to its neutral position which corresponds to a position intermediate between the ends of the stroke of said control shaft in the axial direction,

a second spring loaded over the upper portion of said control shaft for normally biasing said control shaft downward to its neutral position,

stopper means for limiting the spring action of said first spring in such a manner that said control shaft may be prevented from moving past its neutral position,

an improvement comprising

a bore coaxially extended through the upper portion of said control shaft from the upper end thereof and downward a predetermined distance,

a stationary rod which has its upper end securely attached to the steering column and is telescopically inserted into said bore of said control shaft,

a small-diameter rod extended downward from the lower end of said stationary rod coaxially thereof,

a spring retaining ring axially slidably fitted over said small-diameter rod,

a stopper ring attached to the lower end of said small-diameter rod for engagement with said spring retaining ring to limit the downward movement of said spring retaining ring,

a step at the bottom of said bore for engagement with the undersurface of said spring retaining ring, and

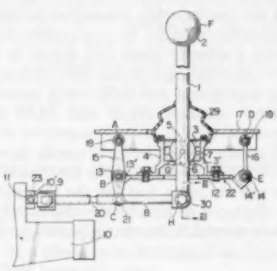
said second spring fitted over said small-diameter rod and loaded between the lower end of said stationary rod and said spring retaining ring.

4,132,124

SHIFT MECHANISM FOR AUTOMOTIVE TRANSMISSION

Hiroshi Iida, Kariya, Japan, assignor to Manno Kogyo Company, Limited, Anjo, Japan

Filed Sep. 20, 1977, Ser. No. 835,080
Claims priority, application Japan, Sep. 29, 1976, 51-130882[U]; Mar. 22, 1977, 52-34466[U]
Int. Cl.[2] G05G *7/00*
U.S. Cl. 74—473 R **5 Claims**



1. A shift mechanism for an automotive transmission comprising:

(a) a shift lever having a knob fixed at the upper end thereof,

(b) a parallelogram double rocker linkage comprising

a pair of parallel rockers each having its upper end pivoted to a chassis, and

a coupler having its both ends pivoted to said pair of rockers in such a way that the line connecting the pivoted points of said coupler may be in parallel with the line connecting between the upper pivotal points of said pair of rockers,

(c) means mounted on said parallelogram double rocker linkage for pivotably supporting said shift lever,

(d) a control rod having its one end pivoted to the lower end of said shift lever and its other end pivoted to a control shaft extended from said automotive transmission for transmitting the movement of said shift lever to said control shaft, and

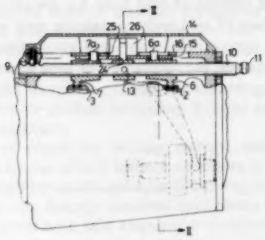
(e) a support rod which is extended substantially in parallel with said control rod and which has its one end pivoted to the lower end below said pivotal point to said coupler of one of said parallel rockers and its other end pivoted to the housing of said automotive transmission.

4,132,125

SHIFT MECHANISM IN A MOTOR VEHICLE GEAR BOX

Gregor K. Janiszewski, Göteborg, Sweden, assignor to AB Volvo, Göteborg, Sweden

Filed Jun. 21, 1977, Ser. No. 808,695
Claims priority, application Sweden, Jun. 30, 1976, 7607458
Int. Cl.[2] G05G *5/10, 9/14*
U.S. Cl. 74—477 **6 Claims**



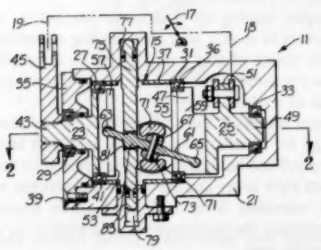
1. In a motor vehicle gear box having an output gear shaft, toothed gears freely rotatably journalled on said shaft, shift mechanism comprising at least two engaging sleeves axially displaceable on the shaft for selectively locking said gears to said shaft, individual shifting forks displaceable in the axial direction of the gear box for axially displacing said sleeves on said shafts, whereby when a gear lever connected to the forks of the shift mechanism is shifted, the forks displace the engaging sleeves to achieve selective locking of the toothed gears to the shaft; the improvement comprising a shifting rod (**10**; **40**) running in the axial direction of the gear box, onto which rod the forks (**6**,**7**) are displaceably journalled, a shift plate (**15**) which is displaceable parallel to and perpendicular to the shifting rod, and a selector plate (**16**) which is displaceable perpendicular to the shifting rod, the shift plate and the selector plate being superposed and both being provided with at least two control openings (**31**,**32** and **34**,**35** respectively) which hold a portion (*6a*,*7a*) of their respective fork and have such a shape that only one of the forks can be moved at a time by the shift plate while the other forks are locked in a neutral position by the selector plate, and that the selection of the fork which is to be displaced is done by moving the shift plate and the selector plate perpendicular to the shifting rod.

4,132,126

RATIO SELECT MECHANISM

David C. Hussey, Laguna Beach, Calif., assignor to Bertea Corporation, Irvine, Calif.

Filed Sep. 2, 1977, Ser. No. 830,185
Int. Cl.[2] G05G *11/00*
U.S. Cl. 74—479 **14 Claims**



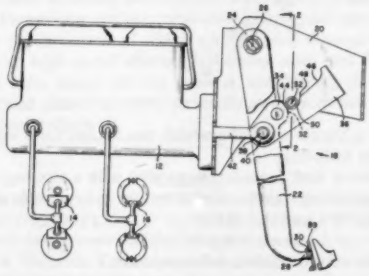
1. A ratio select mechanism comprising:
a supporting structure;
first and second rotary input members;
means for mounting said first and second rotary input members on said supporting structure for rotational movement about first and second rotational axes, respectively;
a connecting lever extending between said rotary input members, first and second portions of said connecting lever being adjacent said first and second rotary input members, respectively;
means for mounting said first portion of said connecting lever on said first rotary input member for movement along a first path having a component which extends radially of said first rotational axis whereby the radial spacing between the first portion of said connecting lever and said first rotational axis can be adjusted;
means for mounting said second portion of said connecting lever on said second rotary input member for movement along a second path having a component which extends radially of said second rotational axis whereby the radial spacing between the second portion of said connecting lever and said second rotational axis can be adjusted;
said connecting lever being movable in response to rotational movement of said first rotary input member about the first rotational axis when the first portion of said connecting lever is spaced from the first rotational axis and being movable in response to rotational movement of said second rotary input member about the second rotational axis when the second portion of said connecting lever is spaced from the second rotational axis, a portion of said connecting lever being an output region; and
means for moving said first and second portions of said connecting lever along said first and second paths, respectively, to adjust the control which each of said rotary input members has on the movement of said output region.

4,132,127

BRAKE PEDAL MECHANISM

Keith H. Fulmer, Mishawaka, Ind., assignor to The Bendix Corporation, Southfield, Mich.

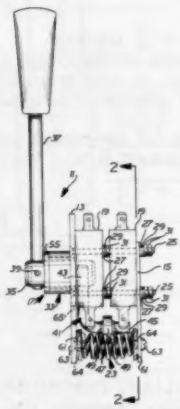
Filed Sep. 6, 1977, Ser. No. 830,923
Int. Cl.[2] G05G *1/14*
U.S. Cl. 74—512 **5 Claims**



1. A linkage mechanism for moving an output member at a variable rate in response to uniform movement of an input member, comprising:
a housing;
a lever having a first end pivotally attached to said housing and a second end;
a plate pivotally attached to said lever having a cam surface thereon;
a push rod pivotally attached to said plate; and
a pin fixed to said housing, said cam surface being adapted to continually engage said pin, said lever moving in an arc about said first end in response to an input force applied to said second end, said plate moving with said lever and rotating on said lever as said cam surface moves with respect to said pin to provide said push rod with linear movement, said linear movement being a function of the

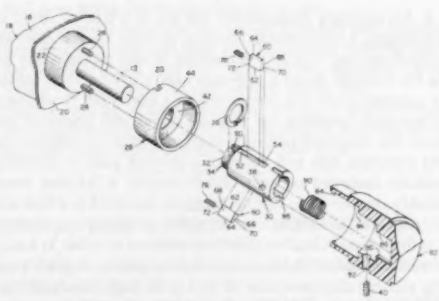
arcuate movement of said lever and the rotative movement of said plate.

4,132,128
ACTUATING MECHANISM
George H. Roggenkamp, Salem, Va., assignor to Eaton Corporation, Cleveland, Ohio
Filed Oct. 28, 1977, Ser. No. 846,297
Int. Cl.[2] G05G *5/06;* H01H *13/28*
U.S. Cl. 74—527 13 Claims



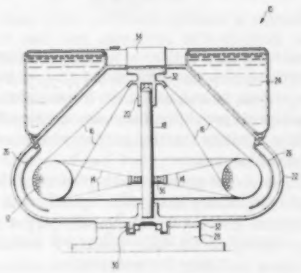
1. A control apparatus comprising a frame member, a control arm mounted for rotary movement on said frame member, and a detent assembly for holding said control arm in any one of a plurality of positions, said detent assembly comprising a roller mounted for rotation on said control arm, and a coil spring mounted on said frame with the coil axis of the spring substantially parallel to the axis of rotation of said roller, said roller bearing against said spring to deflect one or more coils thereof transversely relative to the coil axis.

4,132,129
WEDGE LOCK KNOB ASSEMBLY
Albert R. Pratt, Weston, Mass., assignor to Raytheon Company, Lexington, Mass.
Filed Jun. 3, 1977, Ser. No. 803,002
Int. Cl.[2] A61B *5/12*
U.S. Cl. 74—553 10 Claims



1. A control knob assembly for mounting on an end portion of a rotatable shaft and comprising:
a tubular hub disposed to encircle the end portion of the shaft and having first interlocking means for transmitting rotational movement to the shaft, the hub also being provided with longitudinally sloped means for preventing rotational movement of the shaft;
a nonrotatable member disposed adjacent the hub and having arcuate surface means disposed in spaced coaxial relationship with the sloped means of the hub for locking the shaft in a preselected angular position;
wedge-shaped binding means longitudinally disposed between the sloped means of the hub and the arcuate surface means of the nonrotatable member for axially releasable binding engagement therewith;
a cup-shaped knob shell coaxially disposed with respect to the hub and the nonrotatable member, the shell having releasing means for disengaging the binding means and having second interlocking means for transmitting rotational movement to the shaft; and
spring means disposed between the hub and the shell for resiliently positioning the shell in predetermined relationship with the hub and the binding means.

4,132,130
SAFETY FLYWHEEL
James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Richard T. Schneider, Gainesville, Fla.
Filed Jan. 17, 1977, Ser. No. 760,057
Int. Cl.[2] F16F *15/30;* B60T *11/10;* F16F *9/06*
U.S. Cl. 74—572 12 Claims



1. An inertial energy storage device comprising:
a housing;
a shaft located within said housing;
a flywheel rotationally suspended from said shaft and constructed of a plurality of strands of flexible material;
a braking fluid reservoir; and
rupturable means connecting said reservoir with the interior of said housing;
said material including at least one strand which will fail prior to the failure of the remaining strands and which will pull out from the remaining strands and rupture said rupturable means such that the braking fluid will enter the housing and provide positive braking of the flywheel.

4,132,131
FREE-FLOATING PLANETARY TRANSMISSION WITH CONTRA-ROTATING DUAL OUTPUT SHAFTS
Neil A. DeBruyne, Little Falls, N.J., assignor to Curtiss-Wright Corporation, Woodridge, N.J.
Filed Jul. 14, 1977, Ser. No. 815,551
Int. Cl.[2] F16H *37/06, 57/00, 1/28*
U.S. Cl. 74—675 12 Claims

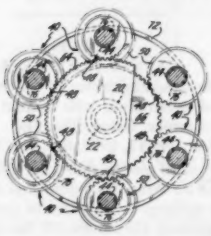
1. A transmission comprising:
(a) a set of free-floating planetary elements spaced circumferentially about the transmission axis and each having a spindle disposed parallel to said axis;
(b) a plurality of axially-spaced rings co-axial with the transmission axis and having rolling contact with said planetary elements to constrain said elements against the radial forces acting thereon;
(c) each said spindle having first, second and third planet

gears mounted on the spindle and axially spaced therealong;

(d) a first toothed wheel co-axial with the transmission axis, said toothed wheel being annular and disposed about said planetary elements with said annular toothed wheel having internal gear teeth meshing with the first planet gear on each said spindle;

(e) at least one input gear meshing with said annular first toothed wheel, said input gear having its axis disposed parallel to the transmission axis;

(f) a second toothed wheel co-axial with the transmission axis and having gear teeth meshing with the second planet gear on each said spindle;



(g) a third toothed wheel co-axial with the transmission axis and meshing with the third planet gear on each said spindle to provide an output for the transmission, said second toothed wheel providing the entire reaction force on each planetary element to the output torque of said third toothed wheel; and

(h) the three planet gears of each planetary element are so spaced apart axially along their spindle that the net turning moment exerted by the input, output and reaction forces tending to tilt each planetary element out of its radial plane including the transmission axis is substantially zero.

4,132,132

POWER TRAIN WITH AN AUXILIARY CREEPER DRIVE SYSTEM

Walter M. Shaffer, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 19, 1976, Ser. No. 743,382
Int. Cl.[2] F16H *47/00*
U.S. Cl. 74—732 **7 Claims**

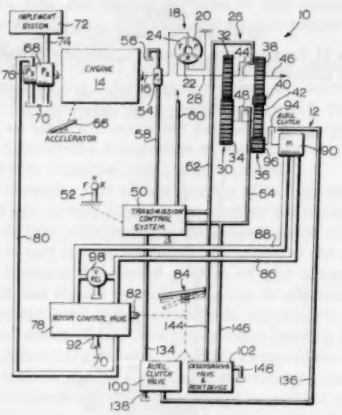
1. A power train with an auxiliary creeper drive system comprising:

a prime mover;

a primary transmission having an output shaft selectively driven by said prime mover;

auxiliary transmission means selectively driven by said prime mover and operatively associated with said output shaft for driving said output shaft at a creeping speed; and

control means for automatically disconnecting said prime mover from driving engagement with said output shaft and drivingly coupling said auxiliary transmission means to said output shaft, said control means including an actuator and being operated solely by manual movement of said actuator.

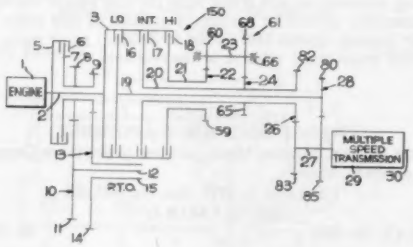


4,132,133

AUXILIARY TRANSMISSION

Gerardus M. Ballendux, Waukesha, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 20, 1976, Ser. No. 752,687
Int. Cl.[2] F16H *3/02*
U.S. Cl. 74—745 **10 Claims**



1. An auxiliary transmission for use in a tractor drive train comprising, a transmission housing, an input shaft connected to a clutch carrier rotatably supported in said transmission housing for rotation about a common axis, a driven shaft mounted for rotation about said common axis, a quill shaft receiving said driven shaft mounted for rotation about said common axis, a sleeve for receiving said quill shaft mounted for rotation about said common axis and defining a driving gear, a plurality of clutches mounted on said clutch carrier, a friction member slidably connected to said driven shaft included in a first of said clutches and permitting disconnection of said driven shaft from said first of said clutches, a second friction member in a second of said clutches slidably connected to said quill shaft permitting slidable disconnection of said quill shaft from said second friction member, a third friction member included in a third of said clutches slidably connected to said sleeve for selective and alternative drive from said input shaft to said quill shaft and slidable disconnection of said sleeve from said third friction member, an interchangeable countershaft gearset carrier including fastening means removably mounting said carrier on said transmission housing and permitting said interchangeable countershaft gearset carrier and said shafts and sleeve to be

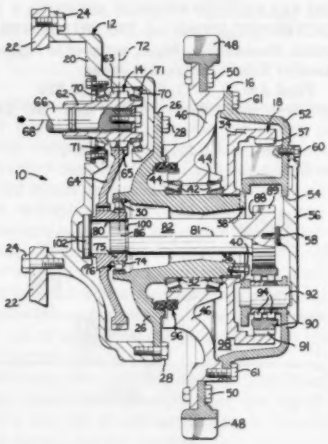
slidably removed from said transmission housing, a driven gear on said quill shaft rotatably mounted in said countershaft gearset carrier for rotation on said comon axis, a plurality of countershaft gearsets angularly spaced and mounted in said countershaft gearset carrier in driving engagement between said driving gear of said sleeve and said driven gear of said quill shaft, a main transmission, a pair of jack shaft gearsets for selectively and alternatively driving from said driven shaft and said quill shaft for providing selective multiple speed drive to said main transmission in response to actuation of one of said clutches on said clutch carrier.

4,132,134

VEHICLE FINAL DRIVE ASSEMBLY

Bennett W. Avery; Charles H. Herr, Jr., and Ivan R. Lamport, all of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 24, 1977, Ser. No. 809,721
Int. Cl.[2] F16H *1/28, 35/00;* B60K *17/00*
U.S. Cl. 74—801 **11 Claims**



1. A vehicle final drive assembly comprising:
a housing structure;
a pinion gear rotatably supported in said housing structure;
a final drive bull gear having an internal coupling, an axis and a central load bearing plane transverse said axis, said bull gear being driven by said pinion gear;
a rolling bearing assembly connected between said housing structure and said bull gear and supporting said bull gear for rotation about said axis, said bearing assembly being located substantially on said central plane; and
a shaft having an external coupling drivingly connected to and supported by said internal coupling of said bull gear, and said shaft being driven by said bull gear.

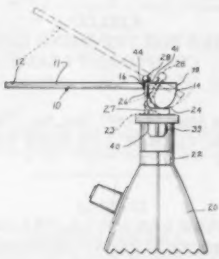
4,132,135

OPENING DEVICE FOR TEAR OPEN PORT OF A CONTAINER

Albert F. Bujan, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Continuation of Ser. No. 709,760, Jul. 29, 1976, abandoned. This application Oct. 14, 1977, Ser. No. 842,445
Int. Cl.[2] B67B *7/00*
U.S. Cl. 81—3.46 A **15 Claims**

1. An opening device for a tear-open port of a container wherein the port is defined by a cover having a substantially flat wall portion in a sealed but tear-open manner and a tab portion extending from said flat wall portion and having an enlarged engagement section spaced from said flat wall portion comprising:
a body member defining a handle portion and a spaced, projecting portion extending from one side thereof;
an opening in said body member defined by at least two spaced wall surfaces, said wall surfaces extending into said body member from one side thereof and extending in a first direction;
support surfaces defined by said body member and being continuous with said wall surfaces, said support surfaces spaced from said one side of said body member and extending away from said wall surfaces in opposing directions from said first direction, said opening adapted to receive said tab portion with said enlarged section positioned in contact with said support surfaces of said body member so that upon placement of said projecting portion on said flat wall portion and said tab portion in said opening with said enlarged engagement section containing said support surfaces of said body member, a force exerted on said handle portion and in a direction opposite to said projecting portion will effect a rotary pulling force on said tab portion by means of said projecting portion and the tearing of said flat wall portion from said port.

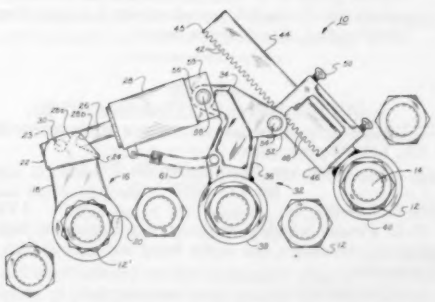


4,132,136

POWER WRENCH FOR TURNING THREADED CONNECTION MEMBERS

Claude H. Wilmeth, Montgomery, Tex., assignor to N-S-W Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 836,622, Sep. 26, 1977, abandoned, which is a continuation-in-part of Ser. No. 784,495, Apr. 4, 1977, abandoned. This application Feb. 21, 1978, Ser. No. 879,534
Int. Cl.[2] B25B *13/46*
U.S. Cl. 81—57.39 **9 Claims**



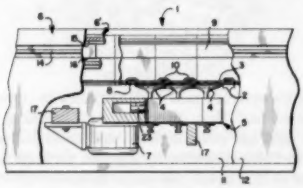
1. A hydraulic actuator wrench for turning threaded connection members arranged in different patterns, said wrench comprising a hydraulic cylinder and a reaction support structure for supporting one end of said cylinder, the improvement wherein said reaction support structure comprises:

an anchor leg having an anchor ring at one end thereof;
a back-up leg having anchoring means at one end thereof and a set of locking means spaced longitudinally therefrom;
a hollow coupler having a set of mating locking means for engaging the locking means on said back-up leg, said coupler means being movably positioned on said back-up leg for different pattern arrangements of threaded connectors, and
pivot means on said coupler for pivotably connecting said coupler means to said hydraulic cylinder.

4,132,137
APPARATUS FOR TRIMMING ELECTRICAL COMPONENT LEADS

Eugene V. Albert, Wichita, Kans., assignor to Q Corporation, Derby, Kans.

Filed Mar. 14, 1977, Ser. No. 778,749
Int. Cl.[2] B23C *1/08*; B26D *7/06*
U.S. Cl. 83—404 **10 Claims**



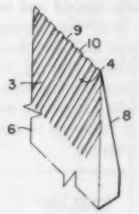
1. An apparatus for trimming electrical component leads depending from a circuit board, said apparatus comprising:
(a) a support structure having a defined path for movement of a circuit board therealong;
(b) drive means mounted on said support structure and having a pulley thereon;
(c) a cutter mounting member supported on said support structure and spaced from said drive means;
(d) a plurality of cutters rotatably mounted on said cutter mounting member and each having a pulley thereon;
(e) endless belt means extending around and in engagement with the pulley on said drive means and the pulley on each of said cutters for driving said cutters; and
(f) means on said support structure for guiding and moving a circuit board along said defined path above said cutters so that leads depending from a lower surface of said circuit board are trimmed by said cutters;
(g) means for adjusting the height of said drive means; and
(h) means on said cutter mounting member for adjusting the vertical position of each of said cutters whereby said cutters trim the leads at a predetermined spacing from the lower surface of said circuit board.

4,132,138
CUTTER FOR A CUTTING MACHINE

Eiji Miyamoto, Kanazawa, Japan, assignor to Marumiya Shoko Co., Ltd., Toyama, Japan

Filed Apr. 28, 1977, Ser. No. 791,682
Int. Cl.[2] B26D *1/08*
U.S. Cl. 83—697 **2 Claims**

1. In a cutter which is mounted on a cutting machine for producing brochures, the cutter being moved obliquely and downwards,
a cutter comprising:
a large number of parallel, grooves and lands formed on a rear side of said cutter and at equal intervals in a manner to extend towards an edge of said cutter and to be slant at an angle of substantially 45° relative to said edge,
an inclined surface which is formed on a front side of said cutter in a manner to incline towards said edge, and
a sharp blade which is formed of said grooves and lands on the rear and said inclined surface on the front and which is formed with teeth and indentations of said blade, and

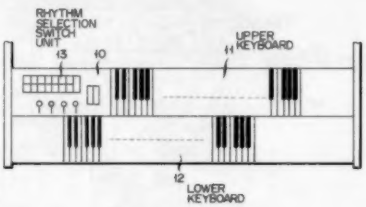


cutter edge ends of said grooves on the rear and said indentations of said blade being formed on a straight line.

4,132,139
RHYTHM SELECTION SWITCH ASSEMBLY FOR ELECTRONIC MUSICAL INSTRUMENTS

Takehisa Amano, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka, Japan

Filed Apr. 8, 1977, Ser. No. 785,826
Claims priority, application Japan, Apr. 10, 1976, 51-44984[U]
Int. Cl.[2] G10H *1/00, 5/00*
U.S. Cl. 84—1.03 **3 Claims**



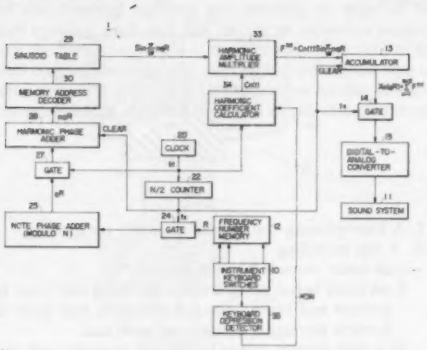
1. An electronic musical instrument comprising:
at least one keyboard;
means coupled to said at least one keyboard for producing musical sounds;
an operation panel located adjacent to said at least one keyboard;
an automatic rhythm generating means; and
a rhythm selection switch means coupled to said automatic rhythm generating means and arranged on the operation panel for selecting a rhythm and contolling a standard or variation mode of the selected rhythm;
said rhythm selection switch means comprising:
a plurality of first switches each of which is a push-type switch, said first switches being coupled to said rhythm generating means for selecting a respective rhythm, said first switches being arranged in two adjacent rows, one above the other; and
one second push-type switch for selecting one of the standard and variation mode of the selected rhythm, said second switch being disposed adjacent to the endmost first switches of each of said two rows so as to be nearest to the player, the operating portion of said second switch being larger in size than that of said first switches and the length of the side of said second switch which is adjacent said endmost switches of the two rows of said first switches being substantially equal to the sum of the lengths of the sides of the two first switches adjacent to said second switch.

4,132,140

ELECTRONIC MUSICAL INSTRUMENT BY DIGITALLY CALCULATING HARMONICS AND COEFFICIENTS

Masanobu Chibana, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 18, 1977, Ser. No. 843,506
Int. Cl.[2] G10H *5/02*
U.S. Cl. 84—1.11 **10 Claims**



1. An electronic musical instrument comprising:

a first means for producing the amplitudes of respective partial components constituting a composite waveshape at successive sample points of said composite waveshape;

a second means for implementing, at first regular time intervals, multiplications of said amplitudes and coefficients associated with said respective partial components to obtain said amplitudes weighted by said coefficients;

a third means for repetitively calculating, at second regular time intervals which are respectively longer than said first regular time intervals, a set of said coefficients associated with all of said partial components, as said multiplications are carried out;

a fourth means for receiving said set of coefficients from said third means to temporarily store this set of coefficients until a new set of said coefficients is received from said third means, and for supplying said stored set of coefficients to said second means in synchronism with said multiplications to be used in implementing said multiplications by said second means; and

a fifth means for converting said set of amplitudes weighted for each said sample point of said composite waveshape to a musical sound.

4,132,141

SOLENOID-HAMMER CONTROL SYSTEM FOR THE RE-CREATION OF EXPRESSION EFFECTS FROM A RECORDED MUSICAL PRESENTATION

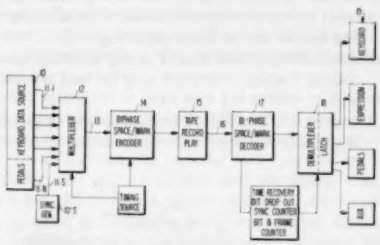
Joseph M. Campbell, and William S. Finley, both of Lewisburg, Tenn., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Apr. 28, 1976, Ser. No. 680,996
Int. Cl.[2] G10G *3/04*; G10H *1/02*
U.S. Cl. 84—115 **2 Claims**

1. A method of producing variable intensity in a solenoid actuated musical note producing instrument comprising the steps of recording a digitally coded signal representing the desired intensity level,

producing a sequence of pulses for selectively energizing one or more of the solenoids in said solenoid actuated musical note producing instrument and

modulating the width of the pulses in said sequence of pulses according to the intensity level in said recorded digitally



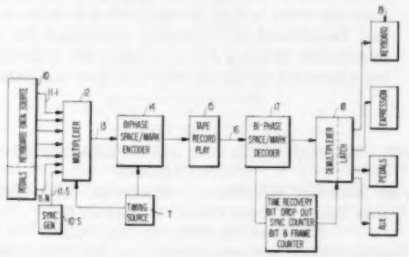
coded signal whereby the average drive energy applied to said solenoid is proportional to said desired intensity level.

4,132,142

METHOD AND APPARATUS FOR REPRODUCING A MUSICAL PRESENTATION

Joseph M. Campbell, Lewisburg, Tenn., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Apr. 28, 1976, Ser. No. 681,093
Int. Cl.[2] G10F *1/00*; G10G *3/04*
U.S. Cl. 84—115 **13 Claims**



1. In a method of recovering musical signals from a serial musical data bit stream for the re-creation of a musical presentation comprising the steps of:

recovering the said musical signals from said serial musical data bit stream,

detecting the loss of at least one musical data bit in said recovered data bit stream, and

preventing the playing of any further notes immediately upon detection of loss of said at least one bit.

4,132,143

FRETTED MUSICAL INSTRUMENT WITH DETACHABLE FINGERBOARD FOR PROVIDING MULTIPLE TONAL SCALES

Thomas D. Stone, Novato, Calif., assignor to Intonation Systems, Fairfield, Iowa

Filed Jan. 6, 1977, Ser. No. 757,427
Int. Cl.[2] G10D *3/06*
U.S. Cl. 84—314 **13 Claims**

1. A fretted stringed musical instrument adapted to provide a plurality of predetermined tonal scales, each contained on a different quickly attachable and detachable fingerboard, said instrument comprising:

a body;

fingerboard mounting means secured to said body for enabling rapid attachment and detachment of a fingerboard;

at least one string arranged along said fingerboard mounting means;

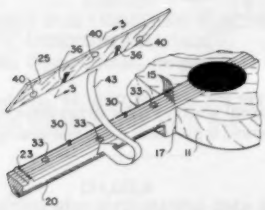
first means at a first location for securing a first end of said at least one string;

means adjacent said first string securing means for providing a first vibration stop for said at least one string;

second means at a second location for securing the remaining end of said at least one string;

means adjacent said second string securing means for providing a second vibration stop for said at least one string; and

a fingerboard detachably secured to said fingerboard mounting means at a predetermined location relative to said first



and second vibration stops and having a plurality of frets lying below said at least one string, said frets being arranged along the length of said fingerboard in accordance with said predetermined tonal scale, each said fret providing an additional vibration stop for said at least one string when the latter is placed in contact therewith, said fingerboard being devoid of string engaging means when said at least one string is in an at-rest position in order to permit said fingerboard to be rapidly exchanged for another fingerboard having a different tonal scale without requiring substantial slackening of said at least one string.

4,132,144

VOLUME ADJUSTER FOR AIR OPERATED MUSICAL INSTRUMENTS

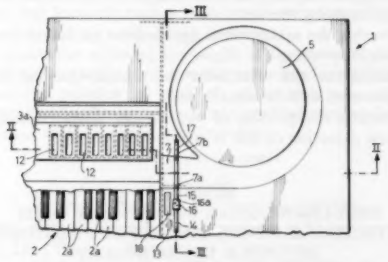
Paolo Bontempi, Montelupone (Macerata), Italy, assignor to Comus S.p.A., Potenza Picena (Macerata), Italy

Filed Nov. 18, 1976, Ser. No. 742,947

Claims priority, application Italy, Dec. 10, 1975, 22856 B/75

Int. Cl.[2] G10B *3/04*

U.S. Cl. 84—359 **4 Claims**



1. In an air-operated musical instrument, such as an electric organ, having a main body equipped with a keyboard, a flat keyboard surround adjacent the keyboard, a reed chamber extending below and parallel to the keyboard, a blower and a delivery duct arranged to deliver air from the blower to the reed chamber, the improvement which consists of volume adjusting means comprising an elongate slider movable in a rectilinear guide in the flat keyboard surround, an elongate slider movable in said guide, and a valve member affixed to said slider and movable thereby transversely across said delivery duct between positions of minimum and maximum obstruction of air flow through the said delivery duct.

4,132,145

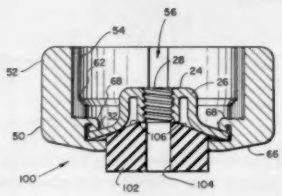
FREE SPINNING WASHER-NUT ASSEMBLY

Charles H. Becker, Braintree, Mass., assignor to TRW Inc., Cleveland, Ohio

Filed Apr. 11, 1977, Ser. No. 786,170

Int. Cl.[2] F16B *37/00, 39/24*

U.S. Cl. 85—32 R **16 Claims**



1. A free-spinning washer-nut assembly comprising:

A. A nut including

i. an inner, threaded barrel portion;

ii. an outer barrel portion circumscribing said inner barrel portion and having one end joined to said inner barrel portion through a connecting web; and

iii. a skirt portion joined to the end opposite said one end of said outer barrel portion and extending outwardly therefrom; and

B. a washer comprising an annular body including

i. an upper and a lower end surface;

ii. an inboard surface defining a central aperture extending axially through said washer from said upper end surface to said lower end surface;

iii. the inboard surface defining the aperture with a diameter greater than that of the skirt portion of said nut at and below the upper end surface of said washer;

iv. the inboard surface extending radially inwardly near the lower end surface of said washer to define the aperture with a diameter less than that of the skirt porton of said nut and thereby defining a surface within said washer providing a seat for the skirt portion of said nut;

v. means projecting into the central aperture from the inboard surface of said washer and overhanging the skirt portion of said nut so as to maintain said nut and said washer connected, but independently rotatable relative to one another; and

vi. said means being spaced from the upper end surface of said washer a distance appreciably greater than the thickness of said skirt.

4,132,146

SWIVEL NUT ASSEMBLY

Raimer Uhlig, Munich, Germany, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Jun. 9, 1977, Ser. No. 805,172

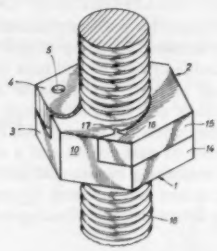
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1976, 2628508

Int. Cl.[2] F16B *37/08*

U.S. Cl. 85—33 **8 Claims**

1. A swivel nut assembly comprises a nut having a pair of opposite sides with a threaded opening extending between and transversely of said opposite sides, said nut comprising a pair of U-shaped disks with each said disk having a first leg, a second leg, and a base interconnecting said legs, means pivotally interconnecting said first legs of said disks so that said disks can be pivoted relative to one another between an open position and a closed position, each said disk forming a U-shaped recess with the portion of the recess formed by said base having at least one screw thread therein, wherein the improvement comprises that the first and second legs of each said disk defines the opposite sides of said U-shaped recess in said disk, said disks in the open position have said second legs disposed in laterally spaced relation and in the closed position have said

second legs disposed in overlapping contacting relation with the threaded bases in said U-shaped recesses forming the threaded opening through said nut and with the second legs extending from said bases in the circumferential direction of the threaded opening, each said U-shaped disk having a first face directed toward the other said U-shaped disk and a second face directed away from the other said U-shaped disk with said first and second faces extending transversely of the axial direction of the threaded opening and defining an edge of the threaded opening, each said disk having an extension projecting from the first face thereon in the direction of the axis of the threaded opening through said nut toward the second face on the other said disk with each said extension having surfaces thereon extending in the axial direction of the threaded open-



ing disposed in contacting engagement with similarly extending surfaces on the first and second legs on the other said disk when said disks are in closed position and in the closed position of said disks a portion of each of said U-shaped recesses combining to form the threaded opening through said nut, each of said extensions extend in the axial direction of the threaded opening at least in part from said base on said disk from which the extension projects, each said extension having a surface extending in the axial direction of the threaded opening in said nut and forming a continuation of the threaded surface of said base in said U-shaped recess and said surface on said extension forming a continuation of the threaded surface of said base and having at least one screw thread thereon forming a continuation of the at least one screw thread in the portion of said U-shaped recess formed by said base.

4,132,147

STORE RETENTION AND RELEASE MECHANISM

Attilio Contaldo, Costa Mesa, Calif., assignor to SPS Technologies, Inc., Jenkintown, Pa.

Filed Aug. 29, 1977, Ser. No. 828,365

Int. Cl.[2] F41F *5/02*

U.S. Cl. 89—1.5 G **16 Claims**

1. A mechanism for selectively retaining and releasing an object, comprising:

plunger means having a first and a second end and including first and second recess means;

elastic means adapted to be carried in said plunger means first recess means;

tubular pin means surrounding said plunger means in slideable relationship therewith, including first recess means in the inside surface thereof being selectively registrable with said elastic means and said plunger means first recess means, a bearing surface adjacent a first end thereof, an opening therethrough adjacent a second end thereof, a shank portion between said bearing surface and said opening, said shank portion forming a recess with respect to said bearing surface;

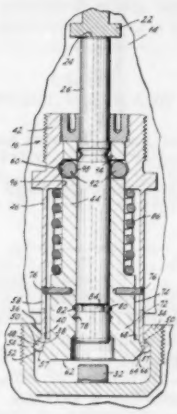
collet means surrounding said pin means including a deflectable portion having a protuberance thereon adjacent a first end of said collet means, said protuberance having a first bearing surface formed to cooperate with said pin means bearing surface, and a second bearing surface, said collet means further including recess means therein spaced from a second end thereof;

wedging means carried in said pin means opening and selectively registering with said plunger means second recess means and said collet means recess means;

retaining means operative to slideably retain said pin means to said collet means in a first released position of the mechanism;

biasing means operative to urge said pin means to the first released position relative to said collet means; and

bushing means formed to be attached to the object including driving means for exerting an axial force on said collet means deflectable portion toward said pin means shank portion when the object is initially engaged, and means thereon adapted to cooperate with said second bearing surface on said collet means protuberance to retain the



object in a second retained position of the mechanism wherein said wedging means registers with said collet means recess means and a surface of said plunger means, and said elastic means registers with said pin means first recess means to fix said pin means, said collet means and said plunger means with respect to each other, and said pin means bearing surface contacts said first bearing surface on said collet means protuberance, said means on said bushing means for retaining the object also being operative to deflect the collet means deflectable portion toward said pin means shank portion in the first released position wherein said plunger means is shifted to a position allowing said wedging means to register with said plunger means second recess means and a surface of said collet means, and causing said pin means bearing surface and said first bearing surface on said collet means protuberance to separate from each other.

4,132,148

EXPELLABLE REACTION MASS FOR RECOILLESS PROJECTILE LAUNCHERS

Rolf Meistring, Glonn; Karl Rudolf, Edelshausen; Werner Schmid, Irschenberg, and Fritz Zeyher, Alpirsbach, all of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Germany

Filed Jun. 24, 1977, Ser. No. 809,677

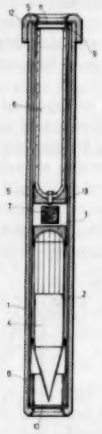
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1976, 2629282

Int. Cl.[2] F41F *3/02*

U.S. Cl. 89—1.701 **15 Claims**

1. A reaction mass for a launching tube having a centrally positioned propellant charge for propelling a missile out of its forward end and a reaction mass located rearwardly of the charge for discharge out of its rear end, comprising an inert,

readily fragmentizing, expellable reaction mass for the substantially recoilless launching of the missile and being of a material



which is internally prestressed and which disintegrates at the launch.

4,132,149

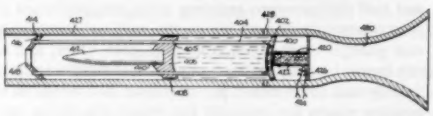
LIQUID PROPELLANT WEAPON SYSTEM

Eugene Ashley, Burlington, Vt., assignor to General Electric Company, Burlington, Vt.

Division of Ser. No. 707,143, Jul. 20, 1976, Pat. No. 4,069,739. This application Oct. 4, 1977, Ser. No. 839,227

Int. Cl.[2] F41F *1/04, 15/00*

U.S. Cl. 89—1.704 **1 Claim**



1. A weapon system comprising:

a gun; and

a round of ammunition;

said gun having a firing bore closed by a breech face;

said round of ammunition disposed in said firing bore adjacent said breech face;

said round of ammunition including:

a relatively high mass projectile means having an aft face; and

a relatively low mass piston, longitudinally spaced from said projectile, having an aft face of relatively large cross-sectional area spaced from said breech face and a forward face of relatively small cross-sectional area, a passageway therethrough, communicating between said aft and forward faces of said piston, and a pressure sensitive obturating means, obturating said passageway and adapted to open said passageway upon a predetermined pressure being provided on said forward face; and

said firing bore has an extension aft of said breech face formed as a converging/diverging nozzle, and

said breech face is provided by a burstable diaphragm disposed in said firing bore aft of said round and forward of said nozzle.

4,132,150

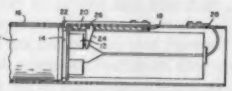
BLAST ACTUATED DETENT

Donald J. Conn, Louisville, Ky., assignor to The Unites States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 8, 1977, Ser. No. 822,851

Int. Cl.[2] F41F *3/04*

U.S. Cl. 89—1.806 **1 Claim**



1. A blast actuated detent for positively restraining a rocket on a launch tube prior to launching comprising: a first restraining means disposed inside of said launch tube to restrain the rocket from rearward motion; an elongated spring detent attached to the outside of said tube, said spring detent being provided with a member extending through said launch tube to engage a detent groove on said rocket and a cam pivotally attached to said first restraining means, said cam mounted on said first restraining means and actuated by said rocket to disengage said spring detent thereby releasing said rocket for launching.

4,132,151

KEY CUTTING APPARATUS

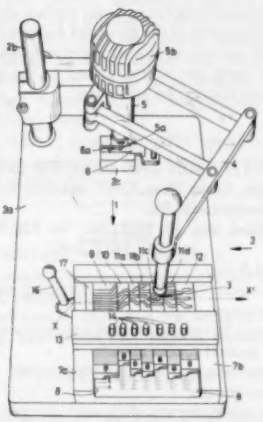
Günter Weber, Wuppertal, Germany, assignor to Neiman S.A., Courbevoie, France

Filed Aug. 11, 1977, Ser. No. 823,751

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1976, 2637969

Int. Cl.[2] B23C *3/35*

U.S. Cl. 90—13.05 **8 Claims**



1. In a device for milling a control profile of a safety key, including a table, a clamp for securing a key blank to be cut fixedly mounted on said table, a motor-driven milling head movably mounted on said table, a tracer member connected to said milling head for effecting control of movement thereof and means to effect the connection between said tracer member and said milling head, the provision of a template comprising:

(a) a carrier for mounting on said table in fixed relationship to said clamp,

(b) a plurality of strips arranged side by side on said carrier,

each strip being slidably adjustable on the carrier in the direction of its longitudinal axis,

(c) coding indicia on said carrier in relation to which said strips are settable, and

(d) means for securing said strips in the positions selected.

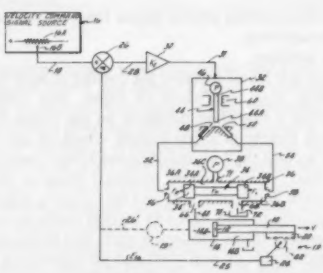
(e) a plurality of strips being formed each with at least two grooves of differing profiles extending across the entire width of the strip, whereby on setting said strips against said indicia according to a predetermined code a continuous groove is formed extending transversely of said strips, said continuous groove serving to guide said tracer member as the milling head effects cutting of the key to the selected coded profile.

4,132,152

CLOSED LOOP ELECTRO-FLUIDIC CONTROL SYSTEM

Denes B. Hunkar, Cincinnati, and Hans Ortlepp, Loveland, both of Ohio, assignors to Hunkar Laboratories, Inc., Cincinnati, Ohio

Filed Oct. 29, 1976, Ser. No. 737,031
Int. Cl.[2] F15B *13/16*
U.S. Cl. 91—364 **11 Claims**



1. A closed loop electro-fluidic control system for controlling the velocity of a movable member induced by the application of pressurized fluid to said member, said system having a zero steady state error signal for nonzero steady state control velocities, comprising:

a source of analog d.c. electrical signals correlated to a desired velocity of said movable member,

velocity transducing means responsive to movement of said member for providing analog d.c. electrical signals correlated to the instantaneous actual velocity of said member,

nonintegrating circuit means responsive to said desired velocity and actual velocity signals for providing an analog d.c. velocity error signal correlated to the instantaneous difference between said desired and actual velocities of said movable member, said error signal being zero when said desired and actual velocity signals have equal nonzero magnitudes,

a valve having a first opening connected to a source of pressurized fluid, a second opening connected to provide fluid flow to said movable member in varying degrees, a third opening connected to a reservoir, and a movable valve closure element, said valve closure element having first and second surfaces, said valve closure element being movable between first and second limits of travel when subjected to a differential fluidic force across said first and second surfaces to simultaneously vary in inverse relationship the sizes of said second and third valve openings to extents dependent on the variable position of said valve closure element relative to said second and third openings,

an electro-fluidic transducer responsive to said analog d.c. velocity error signal for producing a differential fluidic force across said first and second surfaces correlated in magnitude to said error signal, said electro-fluidic transducer providing a zero magnitude differential fluidic force across said first and second surfaces of said valve closure element when said velocity error signal has zero magnitude under conditions where said desired and actual velocities have equal nonzero magnitudes,

said valve closure element having a predetermined position intermediate said first and second limits of travel wherein fluidic flow paths simultaneously exist between said first opening and each of said second and third openings, and

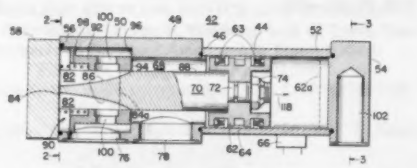
said valve closure element and said electro-fluidic transducer having no interconnection therebetween to return said valve closure element to said predetermined position when said velocity error signal is zero, said valve closure element being subjected solely to forces from said electro-fluidic transducer and remaining displaced from said predetermined position in the absence of force applied thereto by said electro-fluidic transducer once displaced therefrom by forces applied by said electro-fluidic transducer in response to a nonzero error signal input to said electro-fluidic transducer which has subsequently returned to zero upon reaching steady state.

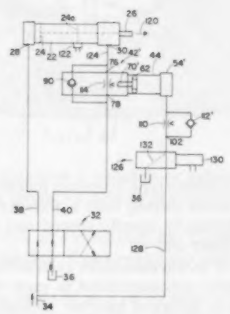
4,132,153

METERING CONTROL VALVE AND FLUID POWER SYSTEM

Gunnar Grotness, and Peter W. Boyer, both of Fort Wayne, Ind., assignors to PHD, Inc., Fort Wayne, Ind.

Filed Nov. 9, 1976, Ser. No. 739,842
Int. Cl.[2] F15B *15/22, 13/042*
U.S. Cl. 91—405 **33 Claims**





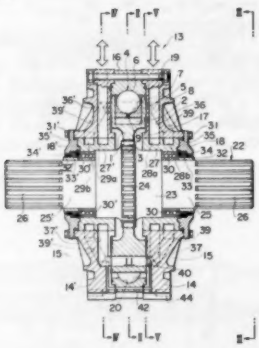
1. In a fluid power system wherein changes in flow rate may occur, said system including a hydraulically actuable device having first and second ports each functioning as inlet and outlet ports, respectively, and a directional valve for selecting the direction of actuation of said hydraulically actuable device: a metering control valve including a cylinder section having a control piston therein; a valve body connected to said cylinder section and having a valve spool-receiving cavity therein, said valve body having first and second axially spaced ports therein communicating with said cavity, one of said valve body ports being coupled to one of said ports of said hydraulically actuable device and the other of said valve body ports being coupled to said directional valve for selectively coupling said other valve body port to a source of fluid under pressure and a sump; a valve spool in said cavity operatively connected to said control piston and movable therewith between first and

second spool positions, said spool having a passage therein extending in the direction of spool movement, said passage communicating with said valve body ports and providing unrestricted fluid flow therebetween in said first spool position, said spool substantially restricting fluid flow between said valve body ports in said second spool position, movement of said spool between said positions thereof progressively metering said fluid flow between unrestricted and substantially restricted conditions, said passage having a surface arranged so that with said spool in one of said positions thereof fluid under pressure entering said passage from one of said valve body ports acts on said surface thereby moving said spool and control piston in one direction to the other of said positions thereof; said cylinder section having a control cylinder port for admitting fluid under pressure thereto thereby to move said control piston and spool in the direction opposite said one direction and for discharging fluid therefrom when said piston and spool are moved in said one direction; and means for metering fluid discharged from said control cylinder port thereby controlling movement of said control piston and spool in said one direction.

4,132,154
RADIAL PISTON TYPE HYDRAULIC PUMP-MOTOR

Kenzo Nishiba, Gifu, Japan, assignor to Teijin Seiki Company Limited, Osaka, Japan

Filed Dec. 16, 1976, Ser. No. 751,322
Claims priority, application Japan, Dec. 27, 1975, 50-157532
Int. Cl.[2] F01B *13/06*
U.S. Cl. 91—491 **3 Claims**

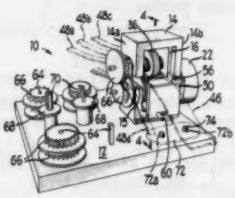


1. In a radial piston type hydraulic pump-motor, comprising:
a cylinder block formed with a plurality of radial cylinders circumferentially equally spaced and each opened at its radially outer end;
a plurality of piston assemblies each including a piston radially slidably accommodated in each of said radial cylinders and a spherical member rotatably retained on the radially outer end of said piston;
a plurality of inlet-outlet passages formed in said cylinder block, each having one end opened at said cylinder chamber and the other end opened exteriorly of said cylinder block;
a housing including a pair of spaced and facing disc casings, and a ring casing interposed between and fixed to said disc casings to define a chamber for accommodating said cylinder block, said ring casing having an inner face formed with a multiplicity of curved recesses and a multiplicity of ridges each separated by said adjacent two curved recesses, said curved recesses and ridges being symmetrical with respect to a central plane passing through the centers of said spherical members and perpendicular to the axis of said cylinder block,
the improvement characterized in that:
said spherical member of each of said piston assemblies is in contact with said curved recesses and ridges at its axially spaced two points symmetrically with respect to said central plane.

4,132,155
PAPER CRAFT KIT

Alan A. Hicks, Chicago, and Harry Disko, South Barrington, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Sep. 16, 1976, Ser. No. 723,988
Int. Cl.[2] B31F *1/00, 1/20*
U.S. Cl. 93—1 G **7 Claims**

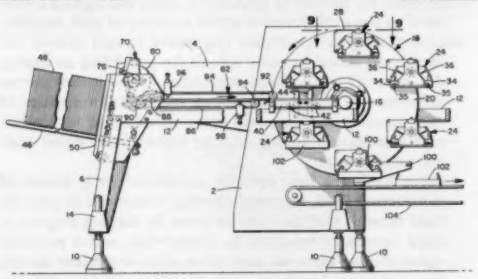


1. A kit for creating artistic forms from a sheet of paper, or the like, comprising:
a frame member;
means on said frame member for cutting at least one individual strip from said sheet of paper, said cutting means including a first shaft mounted on the frame for rotation relative thereto in a first cutting wheel on said first shaft, and a second shaft mounted on said frame member having a second cutting wheel mounted thereon for rotation therewith in proximity to said first cutting wheel wherein at least one of said first and second shafts extends exteriorly of said frame forming a shaft end protrusion;
means mountable on said shaft end protrusion for deforming the paper strip into a non-flat configuration; and
drive means for rotating said first and second shafts.

4,132,156
ROTARY TRAY FORMER

John W. Glaze, Jr., Charlotte, N.C., assignor to Intech Corporation, Charlotte, N.C.

Filed Jun. 21, 1977, Ser. No. 808,680
Int. Cl.[2] B31B *1/02*
U.S. Cl. 93—51.1 **35 Claims**



2. In apparatus for forming a receptacle from a flat receptacle blank, a rotary receptacle former comprising:
a die for supporting the receptacle blank;
a mandrel for engaging the receptacle blank supported by said die;
mandrel moving means for moving said mandrel in a circular path to engage the receptacle blank and pass through said die to form at least a portion of the receptacle;
orientating means associated with said mandrel moving means for constantly maintaining said mandrel in a fixed orientation parallel to said die while said mandrel passes through said die; and

die moving means cooperative with said mandrel for moving said die radially of the circular path to track said mandrel while said mandrel passes through said die to thereby achieve linear motion between said mandrel and said die.

4,132,157

SCORER APPARATUS

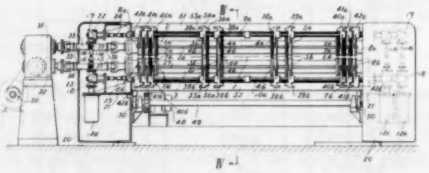
Tsutomu Shinomiya, Iwatsuki, Japan, assignor to Kabushiki Kaisha Tomoku, Otaru, Japan

Filed Jun. 16, 1977, Ser. No. 807,343

Claims priority, application Japan, Jun. 24, 1976, 51-82093[U]; Jun. 24, 1976, 51-82094[U]; Jun. 24, 1976, 51-82095[U]

Int. Cl.[2] B26D *3/08*

U.S. Cl. 93—58.1 **1 Claim**



1. An improved scorer apparatus employing a pair of driving shafts disposed above and below a sheet of material, such as corrugated cardboard, said shafts being separable one from another and being provided with at least two pair of oppositely facing scorer members symmetrically mounted thereon and being slidable in an axial direction for applying score lines to said cardboard; driving shaft means having a plurality of moving shaft means arranged in parallel with said driving shaft means and being connected to a main driving shaft through another connecting shaft means adapted to be axially expanded and contracted; said plurality of moving shaft means being disposed to form co-acting pairs and being connected through to connecting shaft means to cause rotation of connected pairs of said shaft means; means for axially expanding and contracting said connecting shaft means; drive means connected to said driving shaft means for imparting rotary motion thereto; shifter means disposed to engage said scorer members, being mounted on said moving shaft means by being threadably engagable with each pair of moving shaft means said improvement comprising: said driving shaft means are defined by two shafts having guide rail means disposed in parallel therewith, and said shifter means each having a pair of elongated boss portions projecting therefrom and being in slidable engagement at the boss portions with lateral surfaces of said guide rail means, each boss portion being further defined by recess means at one end and projection means at the other end thereof.

4,132,158

VENTILATING INSTALLATION FOR A VEHICLE BODY, ESPECIALLY OF A PASSENGER MOTOR VEHICLE

Sigmund Kania, Sindelfingen, and Wolfgang Frank, Boblingen, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

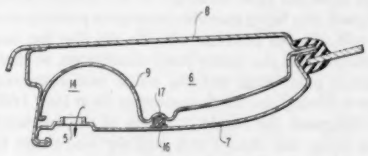
Filed Mar. 10, 1977, Ser. No. 776,247

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1976, 2610731

Int. Cl.[2] B60H *1/26*

U.S. Cl. 98—2.18 **9 Claims**

7. A ventilating installation for a vehicle body having a forced air circulation, comprising a hollow rear column means of a vehicle body including an outer sheet-metal body portion and an inner sheet-metal body portion arranged at a distance therefrom, and relatively narrow side portions extending between said inner and outer sheet-metal body portions so as to delimit a hollow space within said rear column means said rear column means sealingly accommodating within its hollow space with respect to the outer sheet-metal body member air conduction and water discharge means, and at least one air discharge opening means provided within the area of the rear column means, characterized in that the air conduction and water discharge means is constructed as an approximately trough-shaped portion of a partition wall means which is supported at the narrow side portions of the rear column means and extends from a roof area to a wheel casing area of the vehicle body to partition said outer sheet-metal body member



from said inner sheet-metal body member and to serve as a structural bearing part and reinforcing element in said rear column, and in that an inlet for air from the vehicle body is provided in the partition wall means, and wherein the lower boundary of the approximately trough-shaped air conduction and water discharge means is delimited by the lower edge of the lowermost air discharge opening means to thereby allow the conducting away of any water that has penetrated the air discharge opening means.

4,132,159

NOISELESS AIR FLOW DEVICE AND METHOD

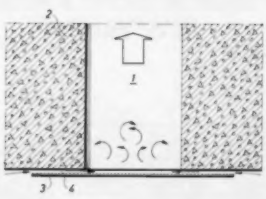
Rolf L. Dellrud, and Torsten R. Hallberg, both of Trosa, Sweden, assignors to Luftkonditionering AB, Trosa, Sweden

Filed Feb. 19, 1975, Ser. No. 551,190

Claims priority, application Sweden, Mar. 1, 1974, 7402782

Int. Cl.[2] F24F *7/00, 13/08*

U.S. Cl. 98—42 R **7 Claims**



1. A method of obtaining a noiseless or substantially noiseless air flow passing through a throttle or damper device which comprises

(a) forming the flow of air entering the throttle or damper device into a plurality of air streams that converge toward one another,

(b) increasing the speed of said air streams at a constant or increasing acceleration as they converge toward each other and as they enter the throttle or damper device — but maintaining the flow of said streams non-turbulent,

(c) quenching at least a substantial portion of the dynamic forces of the accelerating and converging air streams by directing said air streams against each other at an angle approximating 180°, whereby a resulting air mass with a strongly reduced dynamic component results, and

(d) carrying off the resulting air mass resulting from step (c) in a direction different from the plane of flow of the converging air streams.

3. A throttle or damper device for the noiseless or substantially noiseless flow of air therethrough, said device comprising a collar and a disc connected with the duct, and including a restricted passage means in which an air flow undergoes a speed increase with constant or increasing acceleration in the direction of flow, said restricted passage means being so formed that the air flow undergoes a speed increase without

substantial turbulence and without obstacles in the form of rigid bodies in the flow path within or adjacent the area in which the speed increase takes place, at least a substantial part of the dynamic component of the energy states of the flow being quenched within or near the throttle or damper device by means of mutually counter-directed portions of the total flow, thus forming a resultant flow having a greatly reduced dynamic component which is carried off in a direction which differs from the flow direction of the counter-directed part-flows, said disc being movable between a position covering the duct and an open position, wherein the disc has larger outer dimensions than the duct's inner dimensions, so that between the disc's outer edge and the collar said restricted passage means is formed, its width amounting to at least 1/20th of the disc's diameter, the height or width of the restricted passage means being less than 2 mm and the disc's side facing the restricted passage means being plane.

4,132,160

ROOF VENTILATOR

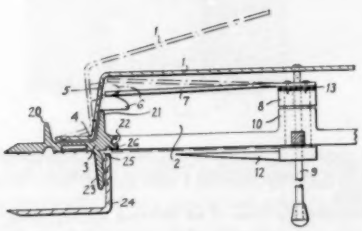
Michael F. Robertshaw, P. O. Box 21, Bridgwater, Somerset, TA6 5LY, England

Filed Jun. 8, 1977, Ser. No. 804,586

Claims priority, application United Kingdom, Jun. 12, 1976, 2442576

Int. Cl.[2] F24F *7/02*

U.S. Cl. 98—42 R **6 Claims**



1. A ventilator panel assembly comprising:

(a) a rim member defining an opening;

(b) a panel member mounted so as to close said opening;

(c) mounting means associated with said rim member;

(d) a shaft vertically supported by said mounting means so as to be vertically slidable therein into a raised position so as to lift said panel relative to said rim,

(e) a movable wiper arm mounted on said mounting means for pviotal movement about an axis centrally disposed in relation to said rim and

(f) a plurality of projection means extending from said panel and engageable by said arm to prevent upwards movement of that part of said panel associated with said projection means, the arrangement being such that when one of said projection means is engaged by said wiper arm and said shaft is raised to raise said panel the direction in which the panel opens is determined by which of the projection means has been engaged.

4,132,161

DEVICE AND PROCESS FOR SEPARATING THE LIQUID PART FROM THE SOLID PART OF SEEDS AND FRUIT

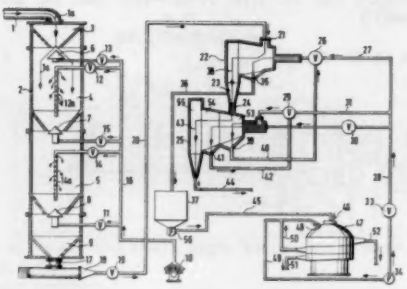
Emmy Helwig, Gladbacher Strasse 224, Elsdorf, Fed. Rep. of Germany (5013)

Filed Jul. 18, 1977, Ser. No. 816,698

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1976, 2632045

Int. Cl.[2] A23B *5/00*

U.S. Cl. 99—472 **8 Claims**



1. An apparatus for separating vegetable matter into a liquid part and a solid part which comprises:

a pressure vessel having at least one high pressure chamber;

means for charging said high pressure chamber with said vegetable matter;

means for pressurising said high pressure chamber;

said pressure vessel having at least one low pressure chamber located below said high pressure chamber;

a valve means located in the bottom of said high pressure chamber and opening up into said low pressure chamber;

means for opening said valve such that said vegetable matter passes through said valve from said high pressure chamber into said low pressure chamber rupturing the cells of said vegetable matter as said vegetable matter passes through said valve to disintegrate said vegetable matter into a mash;

leaching-separating means for leaching out said liquid part of said mash and separating said liquid part from said solid part;

feed means for feeding said mash from said low pressure chamber to said leaching-separating means.

4,132,162

APPARATUS FOR PEELING FRUITS AND VEGETABLES

Robert M. Magnuson, Saratoga, Calif., assignor to Magnuson Engineers, Inc., San Jose, Calif.

Filed Dec. 19, 1977, Ser. No. 862,103

Int. Cl.[2] A23N *7/00*; A47J *17/00*

U.S. Cl. 99—630 **2 Claims**

1. Apparatus for continuously peeling fruits or vegetables comprising:

a substantially horizontal rotary drum;

means for supporting the rotary drum for rotation about its axis of rotation;

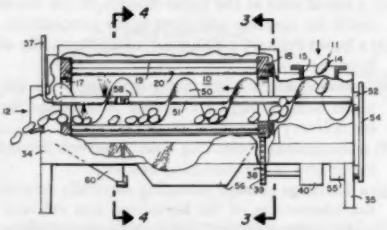
a plurality of rolls having a diameter substantially less than that of the drum;

means for mounting the rolls about the periphery of the drum so as to form the outer wall thereof with each roll being individually rotatable about its own axis and having an abrasive surface;

means for rotating the drum and rolls individually such that fruits or vegetables introduced into one end of the drum will progress therethrough while coming into contact with the rolls for separation of the peel therefrom;

a helicoidal conveyor mounted for rotation on a center shaft coaxial with the drum for effecting movement of the fruits and vegetables through the drum, said center shaft including a center opening therethrough;

means for introducing water only into the drum portion near the exit end thereof including a water supply connecting



with said center opening in said center shaft and openings through the shaft to the shaft exterior near the exit end of the drum;

a trough beneath the portion of the drum into which water is introduced; and

a second trough beneath the drum portions where water is not introduced.

4,132,163

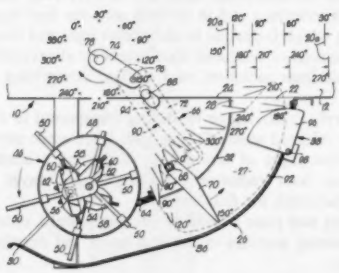
BALER LOADING METHOD

Allen A. White, Peabody, Kans., assignor to Hesston Corporation, Hesston, Kans.

Filed Apr. 9, 1976, Ser. No. 675,529

Int. Cl.[2] B30B *7/04*

U.S. Cl. 100—42 **8 Claims**



1. In a baling method, the improvement of:

in alternating steps, stuffing successive charges of predetermined size and density into a baling chamber and compacting the same within said chamber;

temporarily interrupting at least said stuffing if the charge to be stuffed and compacted is less than said predetermined size and density; and

resuming said alternate stuffing and compacting when the deficiency in the charge is eliminated.

4,132,164

BALER LOADING METHOD AND APPARATUS

Allen A. White, Peabody, Kans., assignor to Hesston Corporation, Hesston, Kans.

Division of Ser. No. 675,529, Apr. 9, 1976. This application Mar. 16, 1977, Ser. No. 778,265

Int. Cl.[2] B30B *1/00*

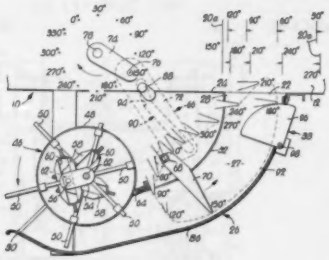
U.S. Cl. 100—189 **17 Claims**

1. Loading apparatus for stuffing a charge of material into a baling chamber for compaction by a reciprocating plunger, said apparatus comprising:

a duct leading into the chamber;

a lever having crop engaging structure at one end thereof;

operating mechanism for driving the opposite end of the lever in a circular path of travel;



a stationary fulcrum about which the lever is turned by the operating mechanism; and

means for allowing the turning point of the lever to seek its own variable position along the length of the lever as the opposite end of the latter is driven by said mechanism, thereby causing said structure to move in a closed loop of travel into, along, and out of said duct.

4,132,165

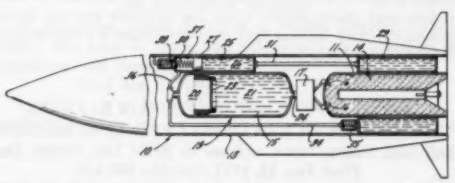
FUEL SUPPLY SYSTEM FOR A MISSILE OR THE LIKE

Plato J. Leeson, Rockford, Ill., assignor to Woodward Governor Company, Rockford, Ill.

Filed Oct. 8, 1976, Ser. No. 730,806

Int. Cl.[2] F42B *13/00*

U.S. Cl. 102—49.8 **6 Claims**

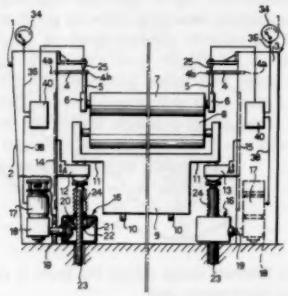


1. A system for supplying fuel to the propulsion combustor of a device having another energy source adapted to be burned to initially propel the device through space, said system comprising a supply of liquid carried by said device, a heat exchanger carried by said device and located to receive said liquid and also to receive heat resulting from the burning of said energy source, said heat exchanger being operable, upon receiving heat, to convert into pressurized vapor the liquid delivered to the heat exchanger, a piston associated with said liquid supply and operable when moved to deliver said liquid to said heat exchanger, means for transmitting part of said pressurized vapor to said piston whereby such vapor moves said piston to effect delivery of said liquid to said heat exchanger, a fuel reservoir containing said fuel and connected to communicate with said combustor, a fluid actuated pumping element associated with said reservoir and operable when actuated to pressurize said fuel and force said fuel from said reservoir to said combustor, and means for delivering pressurized vapor from said heat exchanger to said pumping element when said liquid is heated whereby said vapor actuates said pumping element to effect delivery of said fuel to said combustor.

4,132,166
MOUNTING FOR ROTARY CYLINDERS, PARTICULARLY IN A PRINTING PRESS

Aldo Bugnone, Via Bellini 2, Turin, Italy

Filed Oct. 7, 1977, Ser. No. 840,450
Claims priority, application Italy, Oct. 20, 1976, 69528 A/76
Int. Cl.[2] B41F *13/26, 13/38*
U.S. Cl. 101—247 **2 Claims**

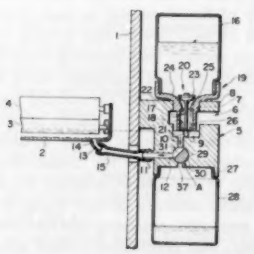


1. A mounting arrangement for rotatable cylinders comprising a support frame, at least two resiliently deformable beam members arranged opposite to each other and fixed to said frame, a first cylinder mounted for rotation in said resiliently deformable beam members, support means mounted in said frame for movement toward and away from said first cylinder, a second cylinder rotatably mounted in said support means parallel to said first cylinder and adapted to contact said first cylinder upon movement of said support means towards said first cylinder, reversible drive means for moving said support means and said second cylinder toward and away from said first cylinder, sensor means mounted on said frame and disposed in contact with said beam members for providing a signal responsive to the deformation of said beam members, and circuit means including said sensor means and said drive means responsive to the signal provided by said sensor means to stop said drive means when the pressure exerted by said second cylinder on said first cylinder causes a predetermined deformation of said beam members.

4,132,167
FLUID SUPPLY APPARATUS FOR BLANKET CLEANING DEVICE IN OFFSET PRINTING MACHINE

Koji Ishii, Fuchu, Japan, assignor to Ryobi Ltd., Fuchu, Japan

Filed Jun. 13, 1977, Ser. No. 806,123
Claims priority, application Japan, Jun. 14, 1976, 51-70022
Int. Cl.[2] B41F *35/00*
U.S. Cl. 101—425 **8 Claims**



1. A fluid supply apparatus for a blanket cleaning device in a rotary offset printing machine which includes a cleaning liquid bath having roller means for cleaning the blanket, and a passage for communicating cleaning liquid to and from the bath, comprising:

(a) a u-shaped mounting bracket fixedly secured on its side to a frame of the main body of the printing machine at a vertical position proximate that of the cleaning liquid bath, said mounting bracket having an upper arm and a lower arm;

(b) a new cleaning liquid container mounted in a circular aperture in the upper arm of the mounting bracket for supplying cleaning liquid to the bath;

(c) a liquid pool at the upper portion of the lower arm beneath the aperture and open to the atmosphere;

(d) a liquid delivery passage extending vertically downward from the pool;

(e) a horizontal passage communicating with the cleaning liquid bath through a coupling conduit and intersecting the delivery passage;

(f) a contaminated cleaning liquid reservoir mounted to the lower arm of the mounting bracket;

(g) a discharge passage extending vertically downward from the intersection of the horizontal and delivery passages and communicating with the contaminated cleaning liquid reservoir; and,

(h) a control valve disposed at the intersection of the delivery, horizontal, and discharge passages for selectively communicating the delivery and horizontal passages or the horizontal and discharge passages.

4,132,168
PRESENSITIZED PRINTING PLATE WITH IN-SITU, LASER IMAGEABLE MASK

John O. H. Peterson, Cape Elizabeth, Me., assignor to Scott Paper Company, Philadelphia, Pa.

Continuation of Ser. No. 434,255, Jan. 17, 1974, abandoned. This application Jul. 25, 1977, Ser. No. 818,644
Int. Cl.[2] B41C *1/10;* **G03F** *7/08*
U.S. Cl. 101—471 **1 Claim**

1. The method of imaging a planographic printing plate which comprises a support layer, a first layer of material which is sensitive to ultraviolet light and is overlying the support layer, and overlying and in contact with the first layer, a second layer which is opaque to ultraviolet light and is capable of being removed or rendered transparent to ultraviolet light by non-actinic laser radiation, said method comprising the steps of:

selectively removing or rendering transparent to ultraviolet light selected areas of the second layer while not affecting the first layer of material by projecting a beam of non-actinic laser radiation onto the second layer while in contact with the first layer,

exposing said plate overall to ultraviolet light, removing the remaining portions of the first layer, and developing said plate.

4,132,169
FUEL-AIR TYPE BOMB

Leon L. Gay; Periam B. Hardy, and Donald Hutchinson, all of Boulder, Colo., assignors to Beech Aircraft Corporation, Wichita, Kans.

Filed Nov. 6, 1970, Ser. No. 89,140
Int. Cl.[2] F42B *25/12*
U.S. Cl. 102—6 **9 Claims**

1. A fuel-air type explosive bomb comprising,

a housing;

a nitrated organic liquid fuel selected from the group consisting of ethyl nitrate, normal propyl nitrate, and a mixture of ethyl nitrate and normal propyl nitrate, within the housing;

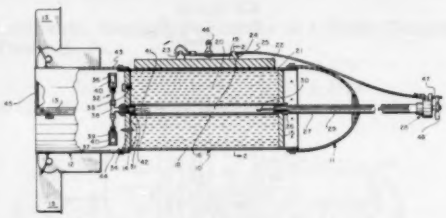
a confined body of low brisance heaving type explosive having a detonation velocity of less than 3,000 feet per second, located within the housing and said liquid fuel which when exploded ruptures the housing and disperses the fuel in an aerosol cloud;

a proximity fuse means supported by the housing, and con-

nected to the low brisance explosive by a shock wave transmission means; and

a fuel-air cloud detonating means carried on the housing, including:

(a) a confined small quantity of high explosive and



(b) a milliseconds time delay detonator associated with said high explosive for detonating the high explosive a predetermined number of milliseconds after the low brisance explosive has exploded and shock wave transmitting means connecting the interior of the body of the low brisance explosive with said time delay detonation.

4,132,170

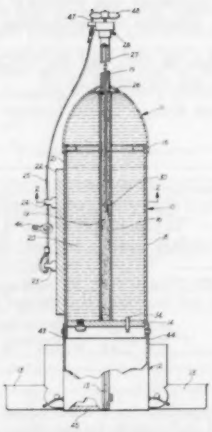
FUEL-AIR TYPE BOMB

Periam B. Hardy; Lewis L. Gay, and Edward L. Husler, all of Boulder, Colo., assignors to Beech Aircraft Corporation, Wichita, Kans.

Filed Feb. 12, 1971, Ser. No. 115,119

Int. Cl.[2] F42B *25/12*

U.S. Cl. 102—6 **13 Claims**



7. A method of causing a fuel-air explosion comprising the steps of:

placing a container having therein a nitrated organic monopropellant liquid fuel, a proximity fuse and an explosive in a dynamic atmospheric environment;

shocking the fuel upon detonating the explosive with a sufficient energy level to thereby cause dispensing of the liquid fuel in an atomized form into the dynamic atmospheric environment and

detonating the fuel in the atomized form from time zero with respect to the atomization thereof, thereby having no time delay between the atomization and detonation of the liquid fuel.

4,132,171

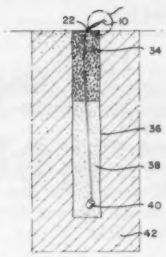
APPARATUS FOR DETONATING AN EXPLOSIVE CHARGE

Daniel E. Pawlak, deceased, late of Issaquah, Wash., and by Cathy J. Pawlak, administrator, 5902-212th Ave. SE., Issaquah, Wash. 98027

Continuation-in-part of Ser. No. 520,475, Nov. 4, 1974, abandoned. This application Aug. 10, 1976, Ser. No. 713,296

Int. Cl.[2] C06C *5/06*

U.S. Cl. 102—28 R **20 Claims**



1. A detonator for initiating fuse cord comprising a tubular jacket adapted to receive said fuse cord at an open end, said jacket enclosing an externally-detonatable explosive charge, said detonator further including isolating means for shock isolating said charge from said jacket such that the shock of said charge exploding is substantially dissipated before reaching said jacket to prevent rupturing the jacket, said isolating means being an air gap surrounding said charge along a substantial portion of the length thereof between said charge and jacket such that explosive shock is substantially dissipated within said air gap.

4,132,172

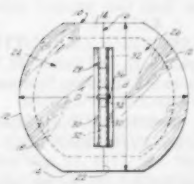
HINGED BRIDGING PLUG FOR EXPLOSIVE PLACEMENT HOLES

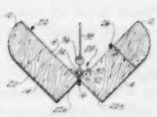
Ned M. Hutchins, Grand Junction; J. Walter Enyeart, Grand Valley, and Leon G. Holbrook, Silt, all of Colo., assignors to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Apr. 13, 1977, Ser. No. 787,013

Int. Cl.[2] F42B *3/20*

U.S. Cl. 102—30 **28 Claims**





24. A bridging plug for a circular explosive placement hole comprising:

a generally elliptical body separated into a pair of opposed segments foldable about a transverse hinge axis, the body having a major axis transverse to the hinge axis, the

breadth of the body along the major axis being greater than the breadth of the body along the hinge axis;

means securing the segments together for allowing each segment to pivot freely about the hinge axis independently of the other segment; and

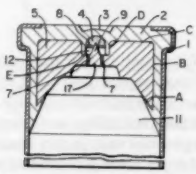
means connected adjacent the hinge axis for lowering the bridging plug in an explosive placement hole and for applying an upward force adjacent the hinge axis which, in cooperation with frictional contact between the segments and the walls of the holes, pivots the segments about the hinge axis jamming the bridging plug in the explosive placement hole.

4,132,173

CARTRIDGE CASE ASSEMBLY

Francisco Amuchastegui, San Sebastian, Spain, assignor to Ziger, S.A., Vitoria, Spain

Filed May 6, 1977, Ser. No. 794,687
Claims priority, application Spain, May 8, 1976, 220.820
Int. Cl.[2] F42B *7/06*
U.S. Cl. 102—44 **5 Claims**



1. A cartridge case assembly of the type constituted by internal wad, external extruded tube and intermediate body or welding mass characterized in that the wad is formed with a hollow cylindrical chamber or cavity at the head side of the case, a longitudinal shaft portion disposed therein with a promontory extending therefrom to a peak in the direction toward the cartridge head, fulminate resting on said peak, all secured together by the intermediate welding mass, said intermediate welding mass fusion-welding the case with the wad, embracing the latter in such a way that the fulminate is included within it, forming an integrating monobloc of case, wad and fulminat, so that appropriate weight means and communication means with the containers chamber of the gun-powder adjacent to wad are included within the space of the fulminate housing.

4,132,174

DRIVERLESS VEHICLE SHUTTLE

Barry L. Ziegenfus, Saylorsburg, and Russell H. Scheel, Easton, both of Pa., assignors to S I Handling Systems, Inc., Easton, Pa.

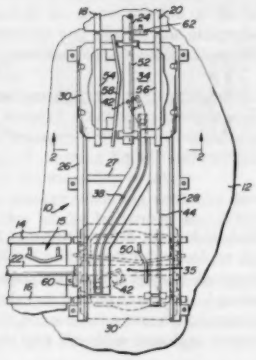
Filed Oct. 13, 1976, Ser. No. 731,871
Int. Cl.[2] B61J *1/10*; B60S *13/02*
U.S. Cl. 104—48 **2 Claims**

1. Apparatus for transporting a driverless vehicle between a pair of vehicle incoming tracks and a pair of vehicle outgoing tracks comprising:

(a) first and second shuttle tracks, a drive shaft between said shuttle tracks, said drive shaft being closer to said first shuttle track than to said second shuttle track, motor means coupled to said drive shaft for causing a shuttle vehicle to reciprocate along said shuttle tracks,

(b) a shuttle vehicle mounted on said shuttle tracks, a rotatable drive wheel on said shuttle vehicle, said drive wheel being in rolling contact with said drive shaft, a turntable supported from below by said shuttle vehicle for rotation about a vertical axis, spaced track means on said turntable for supporting a vehicle, a drive shaft on said turntable between said spaced track means, means on said turntable for stopping a vehicle on the turntable, said shuttle vehicle having an opening in the central portion thereof, an arm connected to said turntable for rotation therewith and extending downwardly through said opening in all positions of said turntable, said arm being spaced from the axis of rotation of said turntable.

(c) cam means for converting linear movement of the shuttle vehicle along said shuttle tracks to rotary movement of



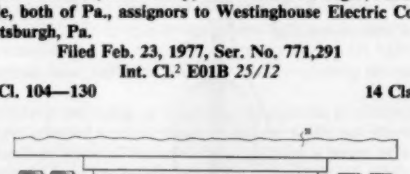
the turntable, said cam means including a portion angled with respect to said first and second shuttle tracks, said angled portion of the cam means being between said first mentioned drive shaft and said second shuttle track, and said arm supporting a cam follower which cooperates with said cam means to cause said rotary movement of said turntable.

4,132,175

SWITCHING APPARATUS FOR MASS TRANSIT VEHICLE

Howard N. Miller, McMurray, and William R. Segar, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 23, 1977, Ser. No. 771,291
Int. Cl.[2] E01B *25/12*
U.S. Cl. 104—130 **14 Claims**



1. In switching apparatus for a mass transit vehicle having support wheels and controllable to pass from a first roadway onto a selected one of a second roadway and a third roadway, with said apparatus including a pair of tracks for said support wheels, the combination of

two guide members positioned between said tracks and with each of said guide members having a top flange,

first guidance means connected to said vehicle and in substantially fixed position relative to said vehicle to pass between and cooperate with said two guide members,

second guidance means connected to said vehicle and movable in position relative to said vehicle to be cooperative with one of said two guide members for controlling the vehicle to pass onto the second roadway, and

third guidance means connected to said vehicle and movable

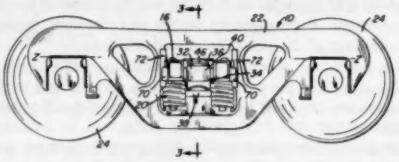
in position relative to said vehicle to be cooperative with the other of said two guide members for controlling the vehicle to pass onto the third roadway.

4,132,176

HYDRAULICALLY DAMPENED RAILWAY TRUCK BOLSTER

Donald Wiebe, Sewickley, Pa., assignor to A. Stucki Company, Pittsburgh, Pa.

Filed Oct. 3, 1977, Ser. No. 838,479
Int. Cl.² B61F *5/06, 5/12, 5/14, 5/24*
U.S. Cl. 105—197 DH **3 Claims**



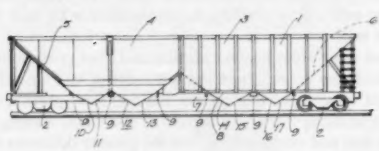
1. In a railway vehicle truck assembly in which a laterally extending bolster member extends between a transversely spaced pair of side frame members and is supported thereby adjacent respective axial end portions thereof by respective spring groups seated on said side frame members, the improvement comprising: elongated longitudinally telescopic hydraulic damping means interposed in each of said spring groups adjacent the outboard side thereof; the longitudinal axis of each of said damping means being inclined inwardly toward the swing axis of the respective side frame adjacent thereto in a manner that the lower end of each of said damping means is operably carried at an outboard location of a respective side frame member and the upper end of each of said damping means is operably positioned in communication with said bolster member at a location spaced inwardly from said lower end; and further that during normal operation of such a rail vehicle truck, said longitudinal axis intersects the vertical axis of symmetry of said respective side frame at a location at least upwardly adjacent said swing axis of said respective side frame; and said damping means being operable to dampen both horizontal and vertical forces applied thereto through said members.

4,132,177

RAPID DISCHARGING HOPPER CAR AUTOMATIC DOOR LATCH

Stanley T. Funk, Cincinnati, Ohio, assignor to Ortner Freight Car Company, Cincinnati, Ohio

Filed Apr. 25, 1977, Ser. No. 790,319
Int. Cl.² B60P *1/56*; B61D *7/02, 7/26, 7/28*
U.S. Cl. 105—310 **6 Claims**



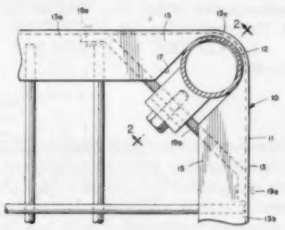
1. Automatic latch means for the door-actuating beam of a hopper car of the type having an elongated frame and a plurality of hopper doors hingedly affixed to said frame in opposed pairs and operatively connected to said door-actuating beam in such a way as to be swingable between a closed position and a downwardly depending open position when said door actuating beam is shifted longitudinally of said hopper car frame between a retracted door-closing position and an extended door-opening position by a fluid cylinder piston rod operatively attached thereto, said latch comprising a catch assembly mounted on said hopper car frame and a pivotable latch hook operatively attached to said beam, means to urge said latch hook into latching engagement with said catch assembly under all dynamic conditions of said hopper car when said door-actuating beam is in said door-closing position and cam means on said piston rod which, when said piston rod is advanced to shift said door-actuating beam to said door-opening position, first disengages said latch hook from said catch assembly prior to shifting said door actuating beam to said door-opening position.

4,132,178

SHELF AND CORNER POST COMBINATION

Floyd F. Mueller, and William A. Gelbuda, both of Two Rivers, Wis., assignors to American Hospital Supply Corporation, Evanston, Ill.

Continuation-in-part of Ser. No. 576,038, May 9, 1975, Pat. No. 3,964,404. This application Jan. 26, 1976, Ser. No. 652,482
The portion of the term of this patent subsequent to Jun. 22, 1993, has been disclaimed.
Int. Cl.² A47B *9/08*
U.S. Cl. 108—144 **23 Claims**



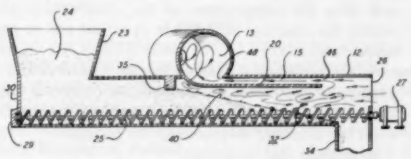
1. A shelf and corner post combination, said post having a series of vertically-spaced indentations along at least one side thereof, said shelf including a perimetric frame having adjacent side members merging to define a post-receiving corner section, said corner section having an inside contour extending about said one side of said post and having at least one horizontal rib received in an indentation of said series, and means provided by said shelf for forceably and releasably engaging said post along a side thereof opposite from said one side for drawing and anchoring the rib of said shelf in said indentation, thereby releasably locking said shelf at a selected elevation along said post.

4,132,179

BURNING APPARATUS

Richard W. Heimburg, 831 Ackerman Ave., and Donald M. Stewart, 104 Robert Dr., both of Syracuse, N.Y. 13210

Filed Sep. 12, 1977, Ser. No. 832,191
Int. Cl.² F23G *3/00*; F23C *9/04*
U.S. Cl. 110—211 **20 Claims**



1. Apparatus for efficiently burning a wide variety of fuels including

a primary burning chamber being open at the rear, and having means operatively associated therewith for moving a supply of fuel from the front of the chamber towards

the rear through a burning zone whereby combustion air is drawn from the open rear of the chamber and caused to pass over the moving bed of burning fuel moving through the burning zone, and

an elongated duct aligned from front to rear within the chamber over the burning zone having an entrance at the rear of the chamber within the burning zone for receiving gas generated within the burning zone and an exit at the front of the burning zone for discharging the gas exterior said chamber whereby said gas passes through the duct in counterflow relationship with the fuel moving through the burning zone, the exit of the duct is operably associated with an afterburner for further extending the burning region for the gases prior to their being exhausted from the system, the afterburner is a section that is positioned in relation to the exit of the duct so that the discharge gases are directed into a vortical flow by the inner wall of the section.

4,132,180

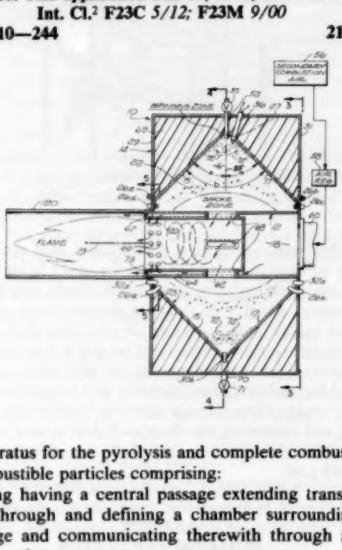
APPARATUS AND METHOD FOR ENHANCING COMBUSTIBILITY OF SOLID FUELS

William L. Fredrick, 19938 Lassen, Chatsworth, Calif. 91324

Continuation-in-part of Ser. No. 600,918, Jul. 31, 1975, abandoned. This application Jul. 22, 1977, Ser. No. 817,995

Int. Cl.[2] F23C 5/12; F23M 9/00

U.S. Cl. 110—244 **21 Claims**



1. Apparatus for the pyrolysis and complete combustion of solid combustible particles comprising:

a housing having a central passage extending transversely therethrough and defining a chamber surrounding said passage and communicating therewith through at least one opening;

means for introducing a pressurized transport fluid stream and solid combustible particles into the chamber;

means for introducing a pressurized velocity fluid into the chamber in a direction to drive the solid combustible particles within the chamber around the central passage and raise the temperature of the combustible particles within the chamber to produce pyrolysis and to generate smoke; and

means for introducing combustion air into one end of the passage so that complete combustion occurs as the combustion air is united with hot gases and smoke flowing from the chamber surrounding the passage.

6. The method that comprises:

introducing a pressurized transport gas carrying entrained solid combustible particles into a chamber at a location to flow therein essentially circularly about essentially a predetermined axis;

introducing a pressurized drive gas into said chamber at a location and velocity and in a direction to mix with the transport gas and drive it and the entrained particles rapidly along essentially circular paths;

directing said rapid circular flow of gases and particles along the inner side of a radially outer wall of the chamber having a maximum diameter portion and inwardly facing surfaces at opposite axial sides of said maximum diameter portion extending generally annularly about said axis and progressively increasing in diameter as they advance axially toward one another;

developing two vortices near said maximum diameter portion of said radially outer wall at which gases and particles which move along said two inwardly facing surfaces spin in opposite directions respectively;

abrading said particles to reduced size by virtue of the rapid movement of the particles within said chamber, including movement of the particles at said vortices;

raising the temperature of said particles in said chamber by engagement of the particles with one another and with the chamber walls, and by partial oxidation of said particles; and

withdrawing said gases and entrained particles from a central location in said chamber.

4,132,181

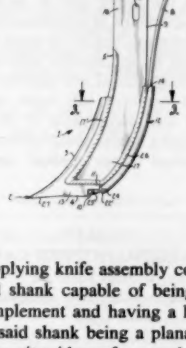
FERTILIZER APPLYING KNIFE ASSEMBLY

Donald D. Smith; Otis L. Davis, III, and Richard Heiniger, all of Colby, Kans., assignors to Ace Service Incorporated, Colby, Kans.

Filed May 23, 1977, Ser. No. 799,393

Int. Cl.[2] A01C 23/02

U.S. Cl. 111—7 **7 Claims**



1. A fertilizer applying knife assembly comprising:

(a) an elongated shank capable of being connected to an agricultural implement and having a leading edge and a trailing edge, said shank being a planar member of steel and having opposite side surfaces and a face end;

(b) a wear point of cast high chrome alloy iron and having a leading portion in engagement with said shank leading edge and a shoe portion in engagement with said shank free end;

(c) said wear point leading portion and shoe portion having a thickness greater than the thickness of said shank;

(d) said wear point leading portion and shoe portion being welded along the length thereof to said shank leading edge and free end respectively with the greater thickness of the wear point portions protecting said welds;

(e) an elongated fertilizer tube spaced from and in trailing relation to said shank trailing edge and having one end portion with discharge ports adjacent said wear point shoe, said fertilizer tube having a transverse dimension less than the thickness of the shank; and

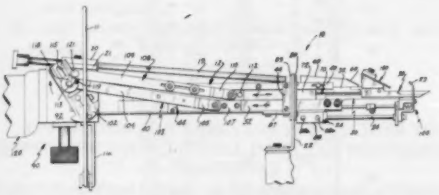
(f) an elongated shield in trailing relation to said shank trailing edge and secured thereto by welding, said shield and shank defining an elongated enclosure for said fertilizer tube extending to adjacent the discharge ports thereof.

4,132,182

TUFTING MACHINE

Theodore C. Heemstra, 958 Hollywood St. NE., Grand Rapids, Mich. 49505

Filed Aug. 8, 1977, Ser. No. 822,821
Int. Cl.[2] D05C *15/00, 15/06*
U.S. Cl. 112—79 R **42 Claims**



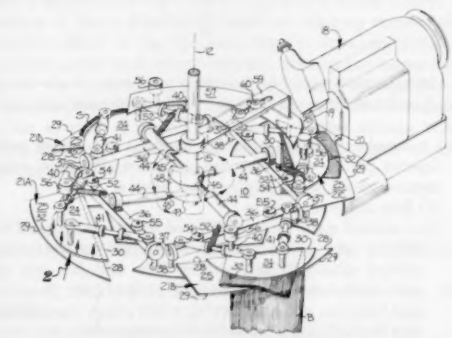
1. A tufting machine for forming loop or cut pile fabrics comprising an elongated, rigid support arm having two ends; means on said support arm for engaging a backing material; forming means at one end of said arm for forming successive loop or cut pile tufts from a continuous length of yarn in the backing material, said forming means including a needle for insertion through a backing, a plunger having a rounded end for pushing at least one loop of yarn through the backing to a predetermined distance beyond the backing at the point of insertion of said needle, and a cutting blade for cutting the loop of yarn; said needle being channel like, hollow and open on one side and receiving said cutting blade and plunger longitudinally and slidably therewithin such that said needle, cutting blade and plunger are aligned and parallel to one another, said cutting blade being intermediate said plunger and the closed side of said needle; slide means mounted on the exterior of said support arm for individually and separately reciprocating said needle, cutting blade and plunger; and drive means at the other end of said support arm for reciprocally moving said slide means in timed relationship to one another.

4,132,183

METHOD AND APPARATUS FOR SEAMING HOSIERY BLANKS

Joseph E. Kienel, Drawer K, Ackworth, Ga. 30101

Filed Feb. 4, 1977, Ser. No. 765,747
Int. Cl.[2] D05B *21/00*
U.S. Cl. 112—262 **10 Claims**



1. A method of seaming the open end portion of a hosiery blank along an arcuate seam line of predetermined curvature to form the toe of the hosiery, and comprising the steps of

conveying a hosiery blank along a curved path of travel which defines an arc of a circle and a first axis, and such that the end portion of the hosiery blank to be seamed protrudes radially outwardly from the first axis, while

pivoting the end portion of the blank about an instantaneous second axis which lies parallel to the first axis during the movement of the blank along such curved path of travel, and while

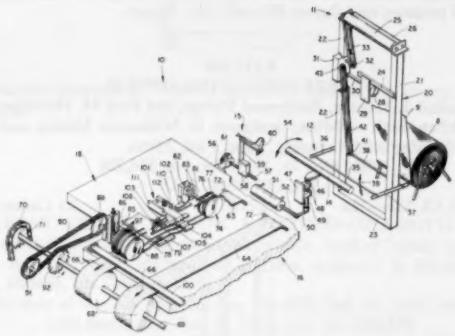
seaming the projecting end portion to close the end of the hosiery blank and form the toe therein.

4,132,184

SHEET MATERIAL GUIDANCE SYSTEM

Perry E. Burton, P.O. Box 68, Fountain Inn, S.C. 29644

Filed May 23, 1977, Ser. No. 799,287
Int. Cl.[2] D05B *21/00, 35/10*
U.S. Cl. 112—262 **4 Claims**



1. A method of guiding a length of sheet material to a sewing machine and the like comprising pulling the sheet material along its length from a supply and feeding the sheet material through a loop first in a downward direction beneath a movable tension bar and then in an upward direction, supporting the tension bar with the sheet material as the sheet material passes through the loop to apply substantially constant tension in the sheet material as the sheet material moves upwardly away from the tension bar, decreasing the rate at which the sheet material is pulled from its supply in response to a downward movement of the tension bar and increasing the rate at which the sheet material is pulled in response to an upward movement of the tension bar, feeding the sheet material over a guide bar from the upper portion of the loop over a work table into a sewing machine, detecting the position of the edge of the sheet material as the sheet material moves from the guide bar to the sewing machine, pivoting the guide bar about an upwardly extending axis located along the direction of movement of the sheet material from the guide bar in response to detecting the movement of the edge of the sheet material away from a desired path of movement, folding an edge of the sheet material over as the sheet material approaches the sewing machine, and pulling the sheet material on and adjacent its hem through the sewing machine with most of the pulling forces being applied to the hem and extending rearwardly through the material adjacent the edge being hemmed whereby the edge of the sheet material is urged into the desired position for folding.

4,132,185

METHOD OF FASTENING AN ALUMINUM ANODE TO THE BOTTOM OF A METAL CONTAINER

Zbigniew Kubik; Piotr Sieracki, and Edmund Skotarczyk, all of Bydgoszcz, Poland, assignors to Kombinat Opakowan Blaszanych Lekkich "Opakomet", Fabryka Opakowan Blaszanych, Bydgoszcz, Poland

Filed Apr. 1, 1977, Ser. No. 783,724
Claims priority, application Poland, Apr. 9, 1976, 188689
Int. Cl.[2] B21D *51/16*
U.S. Cl. 113—120 R **2 Claims**

1. Method of fastening an aluminum plate-type anode to the bottom of a tin plated container covered with a protective

coat, including the steps of: providing an opening on the bottom of the container, forming an inwardly directed flange in the area surrounding said opening; placing an (the) anode plate

(2) on said container bottom, whereby an opening in said anode plate surrounds said container flange and pouring solder (7) until crowded flashes (9,8) are obtained; cooling the solder (7); and pressing said flashes 9,8 until they flatten.

4,132,186

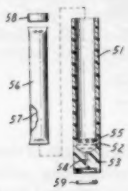
FREEZE INDICATING DEVICE

Wendell J. Manske, Birchwood Village, and Paul M. Hawkins, Afton, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Oct. 31, 1977, Ser. No. 846,726

Int. Cl.[2] G01K *5/32*

U.S. Cl. 116—216 **11 Claims**



1. A freeze indicating device comprising:

(a) a constant total volume container having a first chamber;

(b) said first chamber having a reservoir portion and an elongated portion with a passage communicating at one end with said reservoir portion and at the other end of said device with an indicating material;

(c) a second chamber having an expandable wall, said second chamber located within the reservoir of said first chamber;

(d) an aqueous first liquid in said second chamber;

(e) a second liquid substantially filling said reservoir portion of the first chamber and having a fluid character at the freezing point of said aqueous liquid;

(f) a visible indicating material for said second liquid at the vented end of said passage; and

(g) the length of said passage and the position of said indicating material being such that upon the freezing and expansion of said aqueous liquid, the second liquid in said reservoir is forced through said passage and into contact with said visible indicating material.

4,132,187

MANUAL DEVICE FOR INDICATING SCORES

Ulrich Moebius, Fraunhoferstrasse 45, D-6450 Hanau, Main, Germany

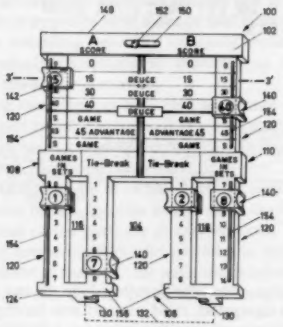
Filed Sep. 6, 1977, Ser. No. 830,851

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1977, 770068[U]

Int. Cl.[2] A63B *71/06*

U.S. Cl. 116—225 **9 Claims**

1. A hand-sized scoring indicator for sports events and particularly tennis, including a plate having opposed front and rear faces, opposed side edges, and opposed upper and lower edges, said plate having upper and lower areas, said lower area including a pair of laterally space legs defined in part by recess means therebetween, each leg having an outer edge defined by one of said opposed side edges, and each leg having an inner edge, score indicia provided on said front face along said opposed side edges in both the upper area and the lower area, and along the inner edge of each leg, and marking slides



mounted on and movable along each of said opposed side edges and each of said inner edges for selective alignment with the score indicia.

4,132,188

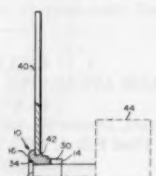
DEVICE FOR SECURING ELEMENTS TO A TAPERED SHAFT

Leroy E. Gjertsen, Buffalo Grove, Ill., assignor to General Signal Corporation, Rochester, N.Y.

Filed Oct. 25, 1977, Ser. No. 844,998

Int. Cl.[2] F16D *1/06*; G01D *13/22*

U.S. Cl. 116—332 **7 Claims**



1. In a pointer assembly including a tapered plastic shaft having a pointer secured thereto, the improvement comprising:

(a) a member having sufficient hardness to deform said tapered plastic shaft disposed symmetrically about said tapered plastic shaft, said member having:

(1) first and second ends;

(2) a conical inner surface disposed about and adapted to receive said tapered plastic shaft, said conical inner surface extending substantially from said first end to said second end and defining a conical bore through said member, said bore having a first inside diameter at said first end and a second inside diameter, smaller than said first inside diameter, at said second end, wherein said tapered plastic shaft extends beyond said second end of said conical bore, whereby said member and said tapered plastic shaft are maintained in a fixed axial relationship;

(3) a stepped outer surface having a first outside diameter at said first end and a second outside diameter, larger than said first outside diameter at said second end; and

(4) at least one slot for deforming said tapered plastic shaft within elastic limits of the plastic material of the shaft when said member is forced into engagement with said tapered plastic shaft, to thereby prevent relative rotational movement between said member and said tapered plastic shaft, said slot extending radially from said inner surface to said outer surface and extending axially from said first end to a point intermediate said first and second ends; and

(b) said pointer surrounding said member and secured thereto.

4,132,189

APPARATUS FOR APPLYING PLASTICIZER TO FIBROUS FILTER MATERIAL IN FILTER ROD MAKING MACHINES

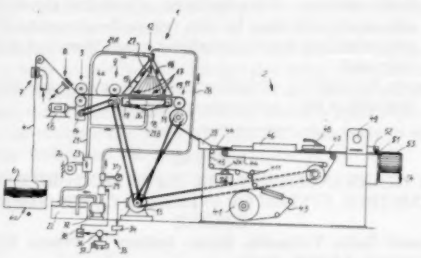
Heinz Greve; Peter Grumer, and Rolf Gomann, all of Hamburg, Fed. Rep. of Germany, assignors to Hauni-Werke Korber & Co. KG., Fed. Rep. of Germany

Filed May 19, 1972, Ser. No. 255,032

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1971, 2146897; Jun. 2, 1971, 2127293; Dec. 1, 1971, 2159428

Int. Cl.[2] B05C *5/00*

U.S. Cl. 118—8 **15 Claims**



1. Apparatus for applying fluid plasticizer to the filaments in layers of fibrous filter material, comprising advancing means for moving a foraminous layer of fibrous filter material along a predetermined path toward, and beyond an impregnating station; a source of plasticizer; an atomizing device located at said station at one side of said path and connected with said source so as to directly propel against each zone of each successive increment of the moving layer at said station a spray of particles of finely distributed plasticizer whereby some of the particles adhere to the filaments and the remaining particles penetrate across such increments; and intercepting means having a surface which is impermeable to fluids in its entirety and is immediately adjacent to said path opposite said atomizing device so that successive increments of the moving layer sweep along said surface and entrain at least some of said remaining particles.

4,132,190

APPARATUS FOR APPLYING NON-LIQUID MATERIAL TO BORE HOLES

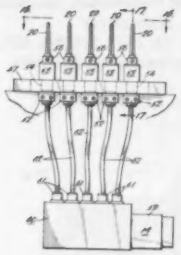
Stanley E. Stahl, 1301 Rothermel Dr., New Berlinville, Pa. 19545

Filed Jul. 6, 1976, Ser. No. 702,887

Int. Cl.[2] B05C *7/00*

U.S. Cl. 118—76 **3 Claims**

1. Apparatus for applying a non-liquid coloring material to the bore of a hole therein which comprises a plurality of spindles rotatably mounted in a support, at least one non-circumferential recess on each of said spindles for receiving the non-liquid material, means for injecting the spindles to the full depth of their associated bores, the support for the spindles being slotted to provide relative adjustable spacing for the spindles, a motor for driving these spindles, and a plurality of



flexible connections between the motor and each of the spindles.

4,132,191

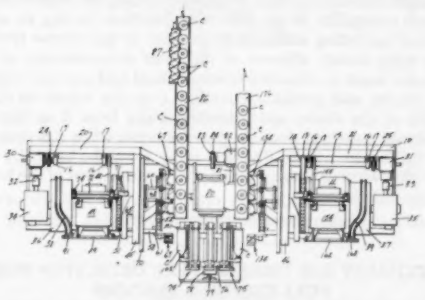
APPARATUS FOR COATING A PORTION OF A BOTTLE

Judson G. Frederick; Benjamin Mercer, Jr., both of Toledo, and John E. Poole, Holland, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 806,138, Jun. 13, 1977, Pat. No. 4,092,447. This application Jan. 16, 1978, Ser. No. 869,570

Int. Cl.[2] B05C *5/02*

U.S. Cl. 118—409 **11 Claims**



1. Apparatus for applying an encircling coating on a glass container comprising:

means for moving containers in spaced-apart series to a first position:

first means at said first position for grasping a plurality of said containers at a time;

means connected to said grasping means for indexing said grasping means and removing the containers from said means for moving the containers, said indexing means moving the containers through an arc of 90° from the vertical to the horizontal;

means for simultaneously receiving the plurality of horizontally oriented containers between a plurality of neck and base engaging chucks;

means connected to said chucks for moving said chucks, as a group, through a 90° arc;

means for rotating said chucks about their horizontal axes;

coater means movable into engagement with the container while being rotated;

second means for grasping the coated containers and removing them from the chucks;

a moving conveyor extending from the application area; and

means connected to said second grasping means for releasing the containers to said conveyor.

4,132,192
MAGNETIC BRUSH DEVELOPING APPARATUS

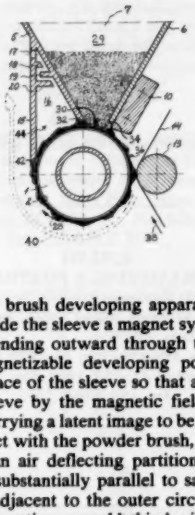
Jacobus R. M. G. Weyers, Maasbree, and Gabriel A. M. Burm, Grubbenvorst, both of Netherlands, assignors to Océ-van der Grinten N.V., Venlo, Netherlands

Filed Aug. 18, 1977, Ser. No. 825,552

Claims priority, application Netherlands, Aug. 19, 1976, 7609195

Int. Cl.[2] G03G *15/09*

U.S. Cl. 118—658 **4 Claims**



1. In a magnetic brush developing apparatus comprising a rotating sleeve, inside the sleeve a magnet system generating a magnetic field extending outward through the sleeve, means for supplying magnetizable developing powder in limited amount to the surface of the sleeve so that a powder brush is formed on the sleeve by the magnetic field, and means by which a support carrying a latent image to be developed can be brought into contact with the powder brush, the improvement which comprises an air deflecting partition having an edge thereof extending substantially parallel to said sleeve surface and lying closely adjacent to the outer circumference of the powder brush at a location spaced behind said powder supplying means, said partition extending over the whole working width of the sleeve and extending away from it so that an airstream entrained over the powder brush when it is rotating at high speed will be diverted away from the brush by the partition without causing powder to be driven out of the brush by air turbulence.

4,132,193
EXHAUST GAS TEMPERATURE DETECTION FOR FUEL CONTROL SYSTEMS

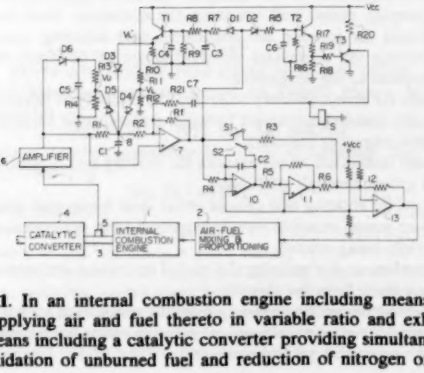
Sadao Takase, Yokohama; Masaharu Asano, and Tadashi Nagai, both of Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed May 9, 1977, Ser. No. 795,150

Claims priority, application Japan, May 10, 1976, 51/52104

Int. Cl.[2] F02B *3/08*; F02M *7/12*

U.S. Cl. 123—32 EE **7 Claims**



1. In an internal combustion engine including means for supplying air and fuel thereto in variable ratio and exhaust means including a catalytic converter providing simultaneous oxidation of unburned fuel and reduction of nitrogen oxides when supplied with exhaust gases containing air and fuel in a certain ratio, apparatus for controlling the ratio of air and fuel in said exhaust means to said certain ratio, the apparatus comprising:

means for generating a first signal indicative of the air-fuel ratio within said exhaust means upstream from said catalytic converter, said first signal generating means being characterized by temperature-related drift in signal level;

means for developing a first fixed voltage representative of the operating temperature of said first signal generating means;

means for developing a second variable voltage representative of the time integral of the signal from said first signal generating means;

means for comparing said first signal with said first and second reference voltages to provide a first output when said first reference voltage is reached and a second output when said second reference voltage is reached;

means for momentarily generating an offset voltage in response to said first output from said comparing means for offsetting said second reference voltage in a direction opposite to the direction of change in magnitude of said first signal;

means for adjusting said air and fuel supply means to vary the ratio of air and fuel supplied to said engine in response to the direction of the deviation of said first signal from said second reference level to reduce the deviation of the ratio of air and fuel in the exhaust means from said certain ratio; and

means for enabling said adjusting means in response to said first output from said comparing means.

4,132,194
VALVE ARRANGEMENT FOR USE IN MIXTURE RATIO CONTROL SYSTEM OF INTERNAL COMBUSTION ENGINE

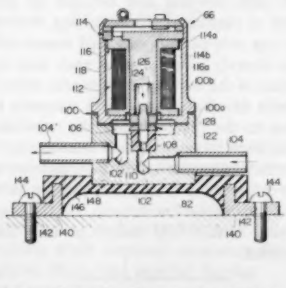
Masaaki Saito, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Apr. 9, 1976, Ser. No. 675,564

Claims priority, application Japan, May 30, 1975, 50/73109

Int. Cl.[2] F02B *3/00*

U.S. Cl. 123—32 EA **7 Claims**



1. In an internal combustion engine including a mixture supply system for producing a mixture of air and fuel to be supplied to the engine cylinders, exhaust cleaning means operative to convert at least one type of air contaminative compound in the exhaust gases from the engine cylinders into harmless composition and a mixture ratio control system operative to detect the concentration of a prescribed type of chemical component of the exhaust gases and control the air-to-fuel ratio of the mixture to be produced in the mixture supply system depending upon the detected concentration of the prescribed type of chemical component, a valve arrangement for use in the mixture ratio control system comprising a valve unit operative to control the flow of air or fuel to be delivered into the mixture supply system, a stationary support member which is mounted separately from the engine, and shock-

absorbingly resilient bracket means intervening between said valve unit and said support member for supporting the valve unit on the support member, said valve unit comprising a casing structure supported by said stationary support member through said resilient bracket means and formed with a fluid inlet port for communication with a source of fluid to be supplied to said mixture supply system, a fluid outlet port communicating with the mixture supply system and a valve chamber intervening between the fluid inlet and outlet ports, a stationary valve seat wall located between said valve chamber and one of said fluid inlet and outlet ports and having a center axis therethorough, a solenoid assembly fixedly mounted within said casing structure and including a cylindrical solenoid coil having an axial bore extending throughout the axial length of the coil and having a center axis substantially in line with said center axis of said valve seat wall, said axial bore having one axial end located at a spacing from said valve seat wall across said valve chamber, and a solenoid core having an elongated portion extending in said axial bore throughout the length of the solenoid coil and having a free end located adjacent to said axial end of said bore, a valve body at least in part formed of ferromagnetic metal and axially movable within said valve chamber between said valve seat wall and said free end of said solenoid core, said valve body being constructed separately of said solenoid assembly and being spaced apart from any internal wall portion forming part of said casing structure and bounding part of said valve chamber, biasing means urging said valve body to axially move toward said valve seat wall, and a flexible member supporting said valve body within said valve chamber and holding the valve body laterally apart from said internal wall portion while allowing the valve body to move axially within said valve chamber.

4,132,195

METHOD AND APPARATUS FOR FUEL MIXTURE CONTROL

Valerio Bianchi, Hochdorf; Siegfried Metcher, Oberriexingen; Reinhard Latsch, Vaihingen; Hans Weidner, Schwieberdingen, and Johannes Brettschneider, Ludwigsburg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 1, 1977, Ser. No. 812,037

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1976, 2632319

Int. Cl.[2] F02B *3/00*

U.S. Cl. 123—32 EA **18 Claims**

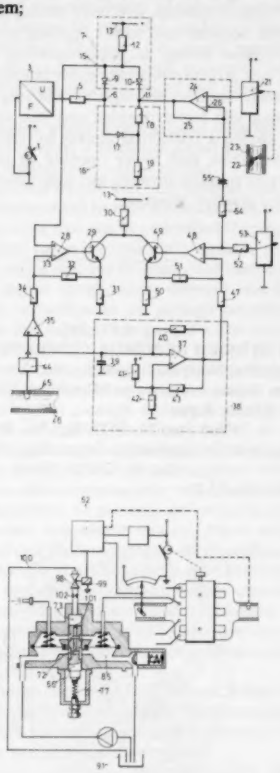
1. An apparatus for controlling the fuel-to-air ratio of the combustible mixture for an internal combustion engine, said engine including an induction tube, an air throttle valve contained in said induction tube and a fuel metering system for providing fuel to the air admitted through said induction tube, and wherein the improvement comprises:

means for generating a first electrical analog signal related to the degree of opening of said air throttle valve;

means for generating a second electrical analog signal related to the actual engine speed (rpm);

electronic circuit means for receiving said first and second electrical analog signals and for generating therefrom an analog output datum equal to the smaller of said first and second analog signals; and

means for coupling said analog output datum to said fuel metering system;



whereby the fuel-to-air ratio of said combustible mixture provided to said engine is set to predetermined values.

4,132,196

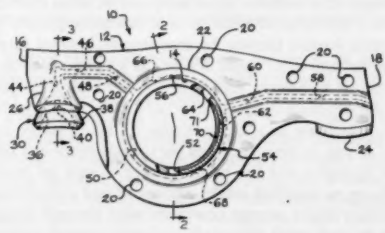
ROCKER ARM

Joseph L. Wherry, Perrysburg, Ohio, assignor to Toledo Stamping & Manufacturing Company, Toledo, Ohio

Continuation-in-part of Ser. No. 618,951, Oct. 2, 1975, abandoned. This application Mar. 9, 1977, Ser. No. 775,955

Int. Cl.[2] F01L *1/18*

U.S. Cl. 123—90.39 **10 Claims**



7. A rocker arm comprising a main body having a central opening terminating in ends on opposite sides of said opening, a bearing sleeve affixed in said opening to be rotatably supported on a rocker arm shaft, one of said ends being formed to provide a surface to engage a valve stem or the like, the other of said ends being formed to provide a socket with a down-

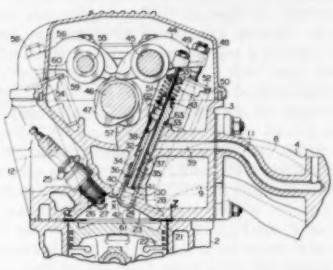
wardly-facing, push rod-engaging surface, said bearing sleeve having a lower opening, said body having an enclosed passage connected between said lower opening and said socket, said bearing sleeve having an upper opening, said body having passage means connecting said upper opening and said one end of said body, and said bearing sleeve having an arcuate groove connecting said lower opening and said upper opening, said groove having a restriction therein to restrict the flow of oil therealong from said lower opening to said upper opening whereby oil supplied through said lower opening to said socket is under a positive pressure.

4,132,197

JET-STREAM CONTROL COMBUSTION ENGINE

Akio Hanawa; Noriyuki Miyamura, and Yasuhiro Oosugi, all of Kyoto, Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Jun. 21, 1977, Ser. No. 808,524
Claims priority, application Japan, Mar. 22, 1977, 52/31850
Int. Cl.[2] F02B *19/16*
U.S. Cl. 123—75 B **14 Claims**



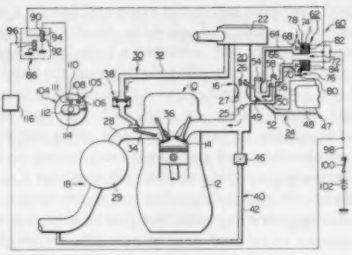
1. A jet-stream control combustion engine comprising, means defining an intake port opened and closed, an intake valve opening and closing said intake port, means defining an exhaust port opened and closed, an exhaust valve opening and closing the exhaust port and a spark plug disposed in a wall defining an upper limit of a combustion chamber formed below the cylinder head, means defining said combustion chamber, means defining a through-hole extending from the upper surface of said cylinder head to said wall, a hollow cylindrical jet piece press-fitted into said through-hole from the combustion chamber side, a hollow cylindrical jet body fitted into said through-hole from the upper side, said jet piece and body being fixed in the cylinder head, so as to rest on respective receiving surfaces formed therein, by screwing an internal thread on an inner surface at an upper end of the jet piece onto an external thread on an outside surface at a lower end of the jet body, a mushroom-shaped jet valve slidably fitted in said jet body, and means defining an annular auxiliary intake passage in a lower part of said jet body between the outside surface of the stem of said jet valve and the inside surface of said jet body, means defining an auxiliary intake passage in said cylinder head, said auxiliary intake passage communicating through holes made in said jet body with said auxiliary intake passage formed in said cylinder head and opening to an injection chamber defined by the inside surface of said jet piece and the head end of said jet valve, said opening being closed by the face of said jet valve on its coming in contact with a valve seat formed at the lower end of said jet body, and said injection chamber communicating with said combustion chamber through an injection port made in said jet piece.

4,132,198

AIR-FUEL MIXTURE CONTROL SYSTEM

Kenji Masaki, and Kenji Okamura, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 10, 1976, Ser. No. 722,268
Claims priority, application Japan, Sep. 11, 1975, 50/110163
Int. Cl.[2] F02M *7/00*; F02B *33/00*
U.S. Cl. 123—119 LR **15 Claims**



1. An air-fuel mixture control system in combination with an internal combustion engine including a plurality of combustion chambers, a carburetor having a main fuel passage, and an intake passageway for conducting air into the combustion chambers, said air-fuel mixture control system comprising fuel flow control means comprising an air bleed passage communicating with the atmosphere and with the main fuel passage, a control valve operable for closing and opening said air bleed passage for controlling the flow of air into the main fuel passage through said air bleed passage for, in turn, controlling the flow of fuel drawn from the main fuel passage into the intake passageway to form rich and lean air-fuel mixtures, respectively, and operating means for operating said control valve into first and second positions to close and open said air bleed passage, respectively; means for generating a predetermined pattern of first and second fuel flow signals in synchronization with the intake operation of the combustion chambers of the engine and for sending said signals to said operating means to provide different air-fuel mixtures to different combustion chambers; said first signal actuating said operating means to place said valve in said first position to, in turn, provide the rich air-fuel mixture, said second signal actuating said operating means to place said valve in said second position to, in turn, provide the lean air-fuel mixture.

4,132,199

AIR-FUEL RATIO CONTROL APPARATUS

Hiroshi Kuroiwa, Hitachi; Yutaka Nishimura; Yoshishige Ohyama, both of Katsuta, and Torazo Nishimiya, Mito, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jul. 11, 1977, Ser. No. 814,623
Claims priority, application Japan, Jul. 12, 1976, 51-81907
Int. Cl.[2] F02B *33/00*
U.S. Cl. 123—119 EC **15 Claims**

1. An air-fuel ratio control apparatus for use in an internal combustion engine having a fixed Venturi type carburetor, an exhaust conduit and an exhaust emission control device including a ternary catalyst, said carburetor including a primary air suction conduit having mounted therein a choke valve, a primary fixed Venturi and a primary throttle valve adapted to be operated by a driver, a secondary air suction conduit having mounted therein a secondary throttle valve adapted to open when the negative pressure introduced into the engine increases, a fuel bowl, a main fuel supply passage for supplying fuel from said fuel bowl into the air in said primary fixed Venturi, a low speed fuel supply passage for supplying fuel from said fuel bowl in the air in the vicinity of said primary throttle valve, and a power valve for increasing the volume of fuel supplied to said main fuel supply passage from said fuel

bowl when the negative pressure introduced into the engine decreases, said air-fuel ratio control apparatus comprising:

means provided in said exhaust conduit for detecting the concentration of one constituent of exhaust emissions;

first fuel control means for effecting control of the rate of fuel flowing through said main fuel supply passage;

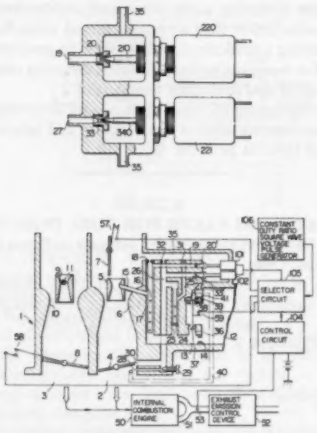
second fuel control means for effecting control of the rate of fuel flowing through said low speed fuel supply passage; and

electric circuit means which inputs a signal from said detecting means and outputs a common signal for controlling said first and second fuel control means;

said first fuel control means and said second fuel control means being constructed in such a manner the region of the air-fuel ratios can be controlled thereby for the low engine speed range is substantially equal to the region of the air-fuel ratios that can be controlled thereby for the intermediate engine speed range, further comprising:

first switch means combined with said choke valve for detecting the movement of the choke valve toward a closed position in an amount which is greater than a predetermined value;

second switch means combined with said secondary throttle valve for detecting the movement of the secondary throttle toward an open position in an amount which is greater than a predetermined value;



third switch means combined with said power valve for detecting the movement of the power valve toward an open position in an amount which is greater than a predetermined value; and

means for maintaining each of said first fuel control means and said second fuel control means in a predetermined condition when at least one of said first, second and third switch means is turned on.

2. An air-fuel ratio control apparatus for use in an internal combustion engine having a fixed Venturi type carburetor, an exhaust conduit and an exhaust emission control device including a ternary catalyst, said carburetor including a primary air suction conduit having mounted therein a choke valve, a primary fixed Venturi and a primary throttle valve adapted to be operated by a driver, a secondary air suction conduit having mounted therein a secondary throttle valve adapted to open when the negative pressure introduced into the engine increases, a fuel bowl, a main fuel supply passage for supplying fuel from said fuel bowl into the air in said primary fixed Venturi, a low speed fuel supply passage for supplying fuel from said fuel bowl into the air in the vicinity of said primary throttle valve, and a power valve for increasing the volume of fuel supplied to said main fuel supply passage from said fuel bowl when the negative pressure introduced into the engine decreases, said air-fuel ratio control apparatus comprising:

means provided in said exhaust conduit for detecting the concentration of one constituent of exhaust emissions;

first fuel control means for effecting control of the rate of fuel flowing through said main fuel supply passage;

second fuel control means for effecting control of the rate of fuel flowing through said low speed fuel supply passage; and

electric circuit means which inputs a signal from said detecting means and outputs a common signal for controlling said first and second fuel control means;

said first fuel control means and said second fuel control means being constructed in such a manner that the region of the air-fuel ratios that can be controlled thereby for the low engine speed range is substantially equal to the region of the air-fuel ratios that can be controlled thereby for the intermediate engine speed range, wherein said first fuel control means comprises an air passage communicating with said main fuel supply passage, and a first electromagnetic valve for controlling the flow rate of air passing through said air passage, and said second fuel control means comprises an air passage communicating with said low speed fuel supply passage, and a second electromagnetic valve for controlling the flow rate of air passing through said air passage, wherein said first electromagnetic valve and said second electromagnetic valve each comprise an on-off electromagnetic valve for opening and closing the respective air passage, and wherein said electric circuit means comprises a control circuit which outputs to each of said electromagnetic valves voltage pulses of a square wave form having a duty ratio consistent with a signal from said detecting means, further comprising:

first switch means combined with said choke valve for detecting the movement of the choke valve toward a closed position in an amount which is greater than a predetermined value;

second switch means combined with said secondary throttle valve for detecting the movement of the secondary throttle valve toward an open position in an amount which is greater than a predetermined value; and

third switch means combined with said power valve for detecting the movement of the power valve toward an open position in an amount which is greater than a predetermined value; and

wherein said electric circuit means further comprises:

a circuit which outputs voltage pulses of a swuare wave form having a predetermined duty ratio; and

a selector circuit for selectively connecting one of said constant duty ratio square wave voltage pulse generating circuit and said control circuit with each of said electromagnets;

said selector circuit being connected to said switch means in a manner to connect said control means with said electromagnets when said switch means all remain inoperative and to connect said constant duty ratio square wave voltage pulse generating circuit with said electromagnets when at least one of said switch means is rendered operative.

3. An air-fuel ratio control apparatus for use in an internal combustion engine having a fixed Venturi type carburetor and an exhaust conduit, said carburetor including an air suction conduit, a throttle valve, a fixed Venturi, a fuel bowl, a main fuel supply passage for supplying fuel from said fuel bowl into the air in the fixed Venturi, and a low speed fuel supply passage for supplying fuel from said fuel bowl into the air in the vicinity of said throttle valve, said air-fuel ratio control apparatus comprising:

detector means provided in said exhaust conduit for detecting the concentration of one constituent of exhaust emissions;

first fuel control means for effecting control of the flow rate of the fuel through said main fuel supply passage;

second fuel control means for effecting control of the flow rate of the fuel through said low speed fuel supply passage;

switch means for detecting the condition of operation of said carburetor; and

electric circuit means which inputs an output signal from said detector means and an output signal from said switch means and which outputs one of a square wave form signal having a duty ratio which is a function of the output signal from said detector means and a square wave form signal having a constant duty ratio, which is arbitrarily selected with regard to said detector means, to said first fuel control means and said second fuel control means depending on said output signal from said switch means.

8. An air-fuel ratio control apparatus for use in an internal combustion engine having a fixed Venturi type carburetor, an exhaust conduit, and an exhaust emission control device including a ternary catalyst, said carburetor including a primary air suction conduit having mounted therein a choke valve, a primary fixed Venturi and a primary throttle valve adapted to be operated by a driver, a fuel bowl, a primary main fuel passage for supplying fuel from said fuel bowl into the air in said fixed Venturi, a primary low speed fuel passage for supplying fuel from said fuel bowl into the air in the vicinity of said primary throttle valve, a secondary air suction conduit having mounted therein a secondary fixed Venturi and a secondary throttle valve adapted to open when the negative pressure introduced into the engine increases, a secondary main fuel passage for supplying fuel from said fuel bowl into the air in said secondary fixed Venturi, a secondary low speed fuel passage for supplying fuel from said fuel bowl into the air in the vicinity of said secondary throttle valve, and a power valve for increasing the volume of fuel supplied from said fuel bowl to said primary main fuel passage when the negative pressure introduced into the engine decreases, said air-fuel ratio control apparatus comprising:

detector means provided in said exhaust conduit for detecting the concentration of one consituent of exhaust emissions;

first fuel control means for effecting control of the flow rate of the fuel through said primary main fuel passage;

second fuel control means for effecting control of the flow rate of the fuel through said primary low speed fuel passage;

switch means for detecting whether or not the displacement of a movable member has reached a predetermined value, the displacement of said movable member varying depending on the condition of operation of said carburetor; and

electric circuit means which inputs an output signal from said detector means and an output signal from said switch means and which outputs, to said first fuel control means and said second fuel control means, a square wave form signal having a duty ratio consistent with the output signal from said detector means when the output signal from said switch means is below a predetermined value and a swuare wave form signal having a constant duty ratio, which is arbitrarily selected with respect to the output signal from said detector means, when the output signal from said switch means has reached said predetermined value.

4,132,200

EMISSION CONTROL APPARATUS WITH REDUCED HANGOVER TIME TO SWITCH FROM OPEN- TO CLOSED-LOOP CONTROL MODES

Masaharu Asano, Yokosuka; Shigeo Aono, Tokyo; Akio Hosaka, Yokohama; Kōkichi Ochiai, Fujisawa, and Michiyoshi Yamane, Tokyo, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 11, 1977, Ser. No. 767,989

Claims priority, application Japan, Feb. 12, 1976, 51-13252

Int. Cl.[2] F02B *32/00, 75/10*

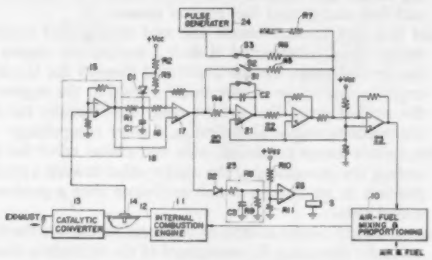
U.S. Cl. 123—119 EC **10 Claims**

1. Closed-loop emission control apparatus for an internal combustion engine having an air-fuel mixing and proportioning device for delivery of air-fuel mixture to said engine in response to a control signal applied thereto, comprising:

an exhaust composition sensor for sensing the concentration of an exhaust composition of the emissions from the engine to provide a concentration representative signal;

means for generating a signal representative of the difference between the concentration representative signal and a reference value;

means for modulating the amplitude of the difference repre-



sentative signal in accordance with a predetermined control characteristic to provide said control signal;

means for detecting when the sensed concentration remains at a value lower than a predetermined value for a duration exceeding a predetermined duration to generate an output;

means for disabling said modulating means in response to the output of said detecting means; and

means responsive to the output of said detecting means for fluctuating the control signal above and below a predetermined level at periodic intervals.

4,132,201

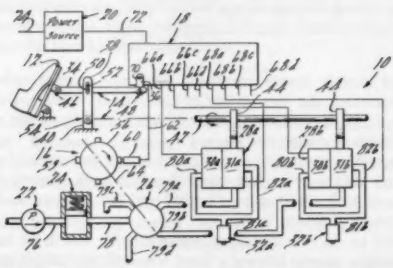
METERING VALVE FOR FUEL INJECTION

Hansueli Bart, Whitehall, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Division of Ser. No. 403,308, Nov. 3, 1973, abandoned. This application May 24, 1976, Ser. No. 689,391

Int. Cl.[2] F02M *39/00, 57/00*

U.S. Cl. 123—139 E **32 Claims**



1. A fluid metering valve adapted to be connected to a source of pressurized fluid, said valve comprising:

a valve housing including a bore, a fluid inlet passage adapted to be connected to said source and having an opening at one end communicating with said bore, and a fluid outlet passage having an opening at one end communicating with said bore;

a valving member in said bore movable from a first static position blocking fluid communication between said inlet passage and said outlet passage to a second static position also blocking said fluid communication;

passage means in said valving member operative during movement of said valving member between said first and second static positions to completely traverse one of said

housing passage openings to momentarily define a continuous passage through said valve housing by serially connecting said inlet passage, said passage means and said outlet passage; and

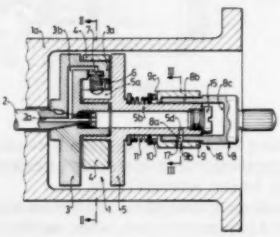
first actuation means operative to move said valving member from said first position to said second static position to effect said complete traversing of said passage means across said one housing passage opening to cause said momentary communication and meter a pulse of fluid through said valve and second actuation means operative to move said valving member from said second static position to said first static position at velocities independent of said first actuation means.

4,132,202

VARIABLE DRIVE COUPLING FOR A FUEL INJECTION PUMP

Kenji Nakayama, and Koji Yamanoi, both of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Apr. 15, 1977, Ser. No. 789,332
Claims priority, application Japan, Apr. 17, 1976, 51-43274
Int. Cl.[2] F02M *39/00*; F16D *5/00*
U.S. Cl. 123—139 AP **9 Claims**



1. A drive coupling for a fuel injection pump including a power imparting shaft and a power receiving shaft, disposed in mutually coaxial configuration within a housing, one of said shafts carrying movable flyweights which move apart under the influence of centrifugal force, the other of said shafts having means for engaging said flyweights to thereby transmit rotary motion between said shafts, the motion of said flyweights being opposed by at least one return spring, wherein the improvement comprises:

a movable support means for said at least one support spring, said movable return means being coupled to a source of hydraulic pressure; and

means for supplying hydraulic pressure from said source in dependence on the magnitude of an engine variable other than engine speed;

whereby the position of said support means and the force of said return spring can be altered to thereby alter the relative angular orientation of said shafts.

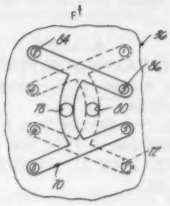
4,132,203

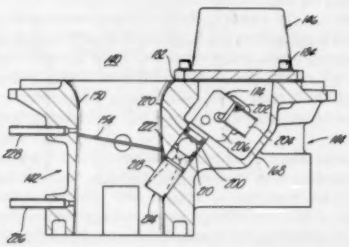
SINGLE POINT INTERMITTENT FLOW FUEL INJECTION

David G. Elpern, Hamtramck, and Gary L. Casey, Troy, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Mar. 17, 1977, Ser. No. 778,822
Int. Cl.[2] F02M *51/06*
U.S. Cl. 123—139 AW **5 Claims**

1. In a fuel management system for an internal combustion engine having a plurality of intake valves and a cylinder associated with each intake valve, the system having a source of fuel, a throttle body mounted on the engine having at least one throat for delivering fuel to the engine, and a manifold plane interconnecting the at least one throat with at least two of the plurality of intake valves, the improvement comprising single point injector means positioned to inject fuel into the throat to supply a fuel charge to each of the at least two of the plurality of intake valves from said single point injector means including means for atomizing the fuel in the throat, means for sensing the time of opening of each of the at least two of the plurality of intake valves, control means for pulsing said single point injector means in response to said sensing means and controlling the injection of the fuel into the throat a preselected time





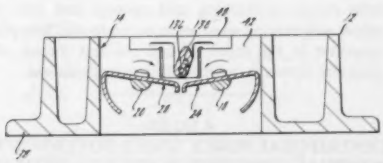
relative to said sensed time of opening of said each intake valve, and means for causing substantially the complete fuel charge created by each said injection to travel to the next opening intake valve and minimize wall wetting including sizing the effective manifold volume for each at least two intake valves between said fuel charge and each of the at least two intake valves to be less than the volume of the cylinder associated with said each intake valve.

4,132,204

FUEL SPRAY BAR AND PRESSURE REGULATOR SYSTEM

Kenneth W. Teague, Dayton, Ohio, assignor to Chrysler Corporation, Highland Park, Mich.

Filed Aug. 30, 1976, Ser. No. 719,022
Int. Cl.[2] F02M *39/00*
U.S. Cl. 123—139 AW **16 Claims**



1. In an internal combustion engine having structure defining an induction air passage via which air may enter the engine for combustion, a fuel distribution system comprising in combination:

a fuel spray bar disposed in said induction passage, said spray comprising a generally horizontal fuel distribution rail extending lengthwise of the spray bar and a plurality of discharge orifices spaced along the length of the spray bar communicating the rail to the induction passage, said spray bar further comprising a body section which,

viewed axially of the rail, is generally T-shaped, said induction passage structure comprising a complementary T-shaped recess within which said body section is disposed; means securing the body section of the spray bar in said recess; and means for supplying liquid fuel to the rail comprising an inlet to the rail in said body section whereby fuel introduced via said inlet is distributed by the rail and is discharged as distinct spray jets via said orifices into the induction passage.

4,132,205

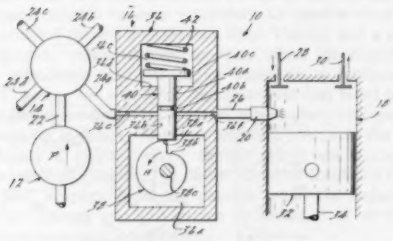
METERING VALVE FOR FUEL INJECTION

Robert C. Merritt, Auburn, N.Y., assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 609,884, Sep. 2, 1975, abandoned. This application Jun. 1, 1977, Ser. No. 802,230

Int. Cl.[2] F16K *31/524*; F02M *39/00*

U.S. Cl. 123—139 BC **18 Claims**



1. A metering valve adapted for use in an injection system of the type including a source of pressurized fluid, a discharge nozzle, passage means for communicating the source with the nozzle, and means for periodically blocking and opening said passage means, said metering valve comprising:

a valve housing having an inlet port and an outlet port adapted to be connected to said source and said nozzle, respectively, by said passage means;

a valving member moveable between first and second positions in said housing and operative to block an interconnection of said ports when in said first and second positions, said valving member including metering means moveable with said valving member for interconnecting said ports when moving between said first and second positions;

resilient means operative to move said valving member from said second position to said first position; and

cam means driven in a timed relation with said periodic means and operative to move said valving member from said first position to said second position when the periodic means is blocking said passage and then abruptly allow said valving member to move to said first position in response to the force of said resilient means when the periodic means is opening said passage means.

4,132,206

CENTRIFUGAL FORCE SPEED GOVERNOR FOR INTERNAL COMBUSTION ENGINES WITH FUEL INJECTION

Max Straubel; Ernst Ritter, both of Stuttgart; Sieghart Maier, and Werner Lehmann, both of Gerlingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 5, 1977, Ser. No. 784,741

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1976, 2616283; Feb. 11, 1977, 2705707

Int. Cl.[2] F02D *1/04*

U.S. Cl. 123—140 R **26 Claims**

1. A centrifugal force speed governor, and in particular idle and maximum speed governors, for fuel injected internal combustion engines, comprising:

(a) an adjustment member coupled to an assembly including speed responsive means and at least one adaptation spring, for producing displacement of the adjustment member as a function of speed;

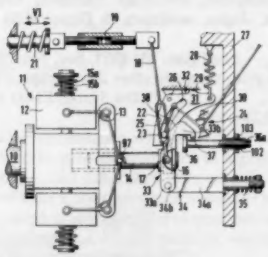
(b) an intermediate lever coupled to the adjustment member, a fuel supply rate adjustment member of a fuel injection pump coupled to said intermediate lever;

(c) a pivot support;

(d) a control element mounted to the pivot support and coupled to the adjustment member;

(e) a stop supported on the governor for limiting the movement of said control element;

(f) energy storing means for yieldingly biasing the movement of said intermediate lever in one direction; and



(g) a setting linkage to which a pin is mounted for engaging the intermediate lever, the control element and the energy storing means; wherein

(i) the displacement of the adjustment member due to the speed responsive means, when regulated by said at least one adaptation spring, produces a negative adjustment of the fuel supply rate adjustment member opposite the sense of regulation, i.e., in a direction of increasing fuel supply as the angular speed of the governor increases;

(ii) said negative adjustment being effected, at least for the full-load position of the setting linkage, by the adjustment member in moving the control element which in turn moves the setting linkage pin stressing the energy storing means and moving the intermediate lever; and

(iii) the stop limits the movement of the setting linkage pin due to the engagement of the control element with said stop, while the pivot support allows further control motions of the adjustment member.

4,132,207

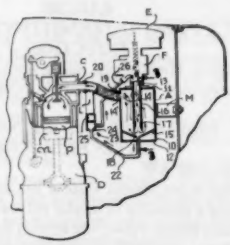
VEHICLE FUEL INJECTION SYSTEM

Ned H. Pettengill, Box 37, S. Royalton, Vt. 05068

Filed May 28, 1976, Ser. No. 690,942

Int. Cl.[2] F02M *29/00*

U.S. Cl. 123—141 **13 Claims**



1. In a vehicle having an engine including a plurality of air-fuel intake cylinders, and a source of air and fuel mixture

therefor, the improvement including a manifold comprised of a readily removable, unitary housing having spaced end walls and an interconnecting wall joining said end walls, an inlet means adapted to be connected to said air-fuel source comprising a conduit disposed in one of said end walls and having a free end extending into the interior of the housing and terminating short of the other end wall, a plurality of substantially equally spaced discharge openings disposed in the interconnecting wall thereof remote from the said other end wall, said openings being disposed in a generally common plane, and a discharge opening provided in said other end wall opposite the free end of said conduit whereby lighter particles of said air and fuel mixture emanating from the conduit will be directed upwardly to be discharged through said openings with the heavier particles of said air and fuel mixture being directed downwardly to be discharged through said discharge opening, means adapted to connect each of said openings to a respective one of said cylinders and conducting said air and fuel mixture thereto, said conducting means being made from non-heat conducting material whereby the housing is separated from said engine a distance to minimize heat exchange relationship therewith, and recirculating means adapted to connect said discharge opening to said source of air and fuel for recirculating said heavier particles.

4,132,208

IGNITION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

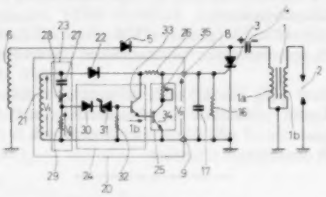
Hideki Yukawa, Susono, Japan, assignor to Kokusan Denki Co., Ltd., Numazu, Japan

Filed Jul. 11, 1977, Ser. No. 814,298

Claims priority, application Japan, Jul. 19, 1976, 51-85796; Aug. 5, 1976, 51-93315

Int. Cl.² F02D *5/04*

U.S. Cl. 123—148 CC **15 Claims**



1. An ignition system for an internal combustion engine comprising an ignition coil,

a semiconductor switch for controlling the primary current of said ignition coil,

a signal source for supplying an AC signal to the control terminal of said semiconductor switch to control said semiconductor switch in synchronism with the rotation of the engine,

characterized by further comprising an angle retarding circuit for retarding application of said AC signal from said signal source to said semiconductor switch,

a phase-advanced signal generating circuit for generating an AC signal in advance in phase of the AC signal from said signal source, and a trigger circuit for providing a control signal to actuate said angle retarding circuit in response to the magnitude of the instantaneous value of said phase-advanced AC signal generated by said phase-advanced signal generating circuit.

4,132,209

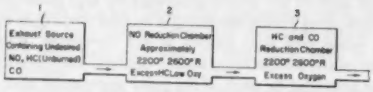
METHOD AND MEANS FOR REDUCING POLLUTANTS FROM THE EXHAUST OF HYDROCARBON FUEL COMBUSTION MEANS

Edwin L. Resler, Jr., Ithaca, N.Y., assignor to Cornell Research Foundation Inc., Ithaca, N.Y.

Continuation of Ser. No. 449,391, Mar. 8, 1974, abandoned, which is a continuation-in-part of Ser. No. 399,498, Sep. 21, 1973, abandoned. This application Feb. 22, 1977, Ser. No. 770,353

Int. Cl.² F02P *13/00*; F01N *3/16*; B01D *53/34*; B01J *1/14*

U.S. Cl. 123—169 R **25 Claims**


1
Exhaust Source Containing Undesired NO, HC(Unburned) CO
2
NO Reduction Chamber Approximately 2200° 2600° R Excess HC Low Oxy
3
HC and CO Reduction Chamber 2200° 2600°R Excess Oxygen

1. In a hydrocarbon-fueled combustion device wherein oxygen-starved combustion products contain an excess of nitrogen oxide relative to an equilibrium value defined by the pressure, temperature and composition parameters of said products of combustion, the improvement which consists of: a source of unburned hydrocarbon, mixing means for producing a mixture of said oxygen-starved combustion products and a quantity of unburned hydrocarbon from said source, and means for maintaining said mixture at a temperature of at least 2200 degrees Rankine thereby reducing the level of nitrogen oxide toward its equilibrium value.

8. The method for reducing the oxides of nitrogen contained in the oxygen-starved combustion products of a hydrocarbon fuel combustion device, said oxides of nitrogen having an excess concentration relative to an equilibrium value defined by the pressure temperature and composition parameters of said products of combustion, which consists of

(a) mixing with said oxygen-starved combustion products a given quantity of hydrocarbon at a time when the oxides of nitrogen exceed the equilibrium value; and

(b) maintaining the resultant mixture at a temperature of at least 2200 degrees Rankine for a period of time to effect a desired accelerated reduction of the oxides of nitrogen toward the equilibrium value.

4,132,210

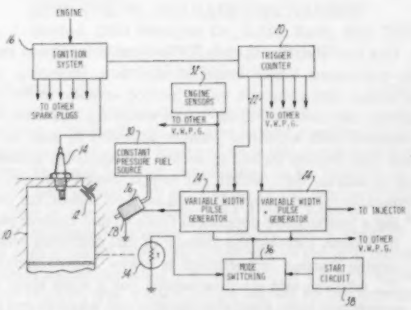
FUEL INJECTION SYSTEM WITH SWITCHABLE STARTING MODE

E. David Long, Elmira, N.Y., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Oct. 1, 1976, Ser. No. 728,805

Int. Cl.² F02B *3/00*; F02N *17/00*

U.S. Cl. 123—179 L **10 Claims**



1. In a fuel injection system for a multicylinder engine, having a fuel source, electrically energized injectors associated

with each cylinder, a plurality of variable width pulse generators controlling the injectors, and an electric circuit which is energized during the starting of the engine, the improvement comprising: a sensor disposed with respect to the engine to experience a temperature related to the engine temperature and having an electric property which has a specific value for each temperature and varies as a function of such temperature; and switching means, responsive to energization of said start circuit for connecting said temperature sensor to all of the variable width pulse generators in a first electronic configuration during energization of said start circuit, wherein decreased engine temperature effects a relatively great increase in duration of each of the pulses generated by said pulse generators, said switching means assuming a second electronic configuration, when said start circuit is not energized, wherein the output of the temperature sensor controls the durations of the pulses provided by each of the pulse generators, and the pulse generators are connected to the temperature sensor so that decreased engine temperature effects a relatively small increase in pulse duration.

4,132,211

FUEL INJECTION SYSTEM

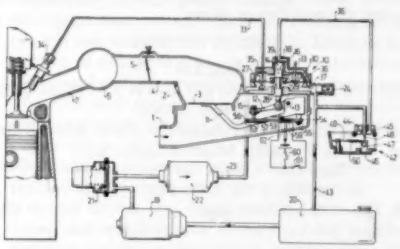
Thomas Wilfert, Markgröningen; Alfred Grassle, Ludwigsburg, and Klaus-Jürgen Peters, Affalterbach, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 13, 1976, Ser. No. 732,127

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1975, 2547645

Int. Cl.² F02N *17/00*

U.S. Cl. 123—179 L **6 Claims**



1. In a fuel injection system for internal combustion engines with continuous intake manifold injection, including an air flow sensor and a throttle valve located seriatim in the intake manifold and also including a fuel metering and distributing mechanism with a control plunger actuated by said air flow sensor and further including means for applying a restoring force to said air flow sensor, the improvement comprising:

bimetallic means, coupled to said air flow sensor, for providing a temperature-dependent force to said control plunger to thereby increase the amount of fuel delivered when the engine starting temperature is below approximately 20° C., wherein said air flow sensor has a main lever and a correction lever pivotable thereon and wherein one end of said bimetallic means is attached to said main lever while the opposite end of said bimetallic means engages said correction lever which actuates said control slide in said fuel metering and distributing mechanism.

4,132,212

TORCH-IGNITION INTERNAL COMBUSTION ENGINE

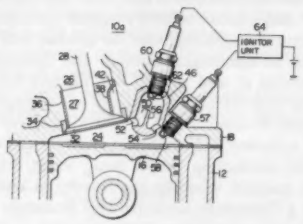
Masaaki Noguchi, Nagoya; Masaharu Sumiyoshi, Toyota; Yukiyasu Tanaka, Okazaki, and Taro Tanaka, Chiryu, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Mar. 29, 1977, Ser. No. 782,512

Claims priority, application Japan, Apr. 2, 1976, 51-37339; Apr. 14, 1976, 51-42698

Int. Cl.² F02B *19/12, 23/08*

U.S. Cl. 123—191 S **15 Claims**



1. In an improved internal combustion engine of the type which includes a cylinder block defining therein a cylinder bore, a piston reciprocally mounted in said cylinder bore, a cylinder head mounted on the top of said cylinder block to cooperate with said cylinder bore and said piston to define a main combustion chamber, said cylinder head defining therein an intake port connected to said main combustion chamber, an intake valve for controlling the communication between said main combustion chamber and said intake port, said main combustion chamber receiving a charge of an air-fuel mixture from said intake port on an intake stroke of said engine, a trap chamber being in communication with said main combustion chamber and adapted to retain therein an amount of an air-fuel mixture during a succeeding compression stroke of said engine, and a spark plug for causing a combustion of the mixture in said trap chamber to cause a torch-ignition of the mixture in said main combustion chamber on a succeeding combustion stroke, said trap chamber being scavenged during an intake stroke of a succeeding cycle of engine operation, the improvement which comprises:

a plurality of torch apertures through which said trap chamber is communicated with said main combustion chamber; and

said spark plug having a set of electrodes disposed within said main combustion chamber and adjacent to that end of at least one of said torch apertures which is open to said main combustion chamber.

4,132,213

ROTARY ENGINE

R. Homer Weaver, 3525 Darby Rd., Havertown, Pa. 19041

Filed Mar. 29, 1977, Ser. No. 782,522

Int. Cl.² F01C *3/02;* **F02B** *53/08*

U.S. Cl. 123—236 **10 Claims**

1. A rotary engine having a power output shaft supported rotatably by a stationary element, and a drive unit for rotating the shaft, said drive unit comprising

(a) a rotary drive element affixed to the power output shaft, said rotary element being disposed in opposing relation to the stationary element and being rotatable relative thereto,

(b) at least one pair of diametrically spaced, rotatable paddle-like pistons mounted on the rotary drive element, each piston being affixed to a separate shaft supported rotatably by said rotary element,

(c) said piston shafts being co-axial, and being disposed radially of the power output shaft, said power output shaft extending intermediate of the piston shafts,

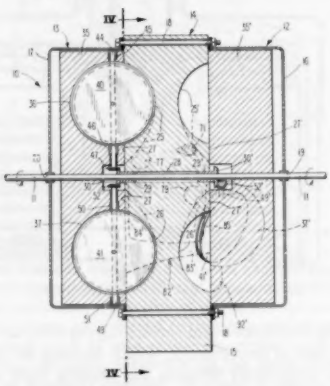
(d) drive means connecting each piston shaft to the stationary element, whereby rotation is imparted to the pistons

when the rotary drive element rotates relative to the stationary element,

(e) a cavity associated with each piston and formed in the rotary drive element and

(f) plural cavities associated with the pistons and formed in the stationary element,

(g) said rotary drive element cavities and said stationary element cavities being of complemental concave configu-



ration to provide clearance for the pistons as the pistons rotate, whereby each piston rotates into and out of complemental cavities as the rotary drive element rotates relative to the stationary element,

(h) said complemental cavities providing drive unit chambers for the reception of a high pressure, expansible fluid for driving the pistons to impart rotation to the rotary drive element and to the power output shaft affixed thereto.

4,132,214

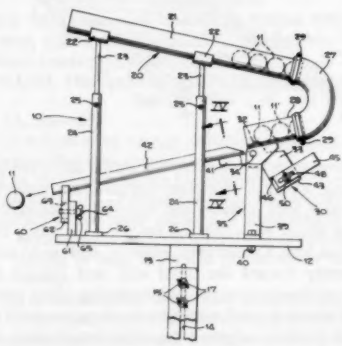
BALL DELIVERY APPARATUS

Myron J. Schnurr, 12560 Havelock Ave., Los Angeles, Calif. 90066; Alvin D. Schnurr, 23428 Sidlee Pl., Harbor City, Calif. 90710, and Marian Schnurr, 12560 Havelock Ave., Los Angeles, Calif. 90066

Continuation-in-part of Ser. No. 638,057, Dec. 5, 1975, abandoned. This application Apr. 20, 1977, Ser. No. 789,258

Int. Cl.[2] F41B *15/00*

U.S. Cl. 124—1 **7 Claims**



1. Apparatus for delivering a plurality of balls one after another to a desired location with a predetermined time interval therebetween comprising:

a support;

ball supply means carried by said support for feeding a plurality of balls by gravity to a ball discharge region; and

pivotally mounted, gravity operated ball retention and discharge means operatively associated with said ball supply means for both retaining a ball fed by gravity to said ball discharge region until a ball is discharged by gravity from said ball discharge region and releasing a ball by gravity to a desired location while a subsequent ball and all remaining balls in said supply means are being prevented from discharge from said ball discharge region, said ball retention and discharge means including ball separation and control means moveable between a first position engaging a first ball in said discharge region and a second position releasing said first ball from said discharge region, while enabling the next ball to enter said discharge region and retaining said next ball and all remaining balls in said supply means;

said ball separation and control means including a counterweight portion, an elongated track portion of a predetermined length and a cam portion between said track and said counterweight portions, said cam portion being pivotally mounted about a location beneath said ball discharge region and being moveable between a retracted position when said separation and control means is in said first position and an elevated position protruding into said ball discharge region between said first ball and said next ball when said separation and control means is in said second position, said second position being such that said track portion slopes downwardly from said discharge region at a predetermined angle, whereby said first ball upon release from said discharge region travels down said track portion to gradually overcome the weight of said counterweight portion and drive said separation and control means into said second position, and upon release from said track portion enables said counterweight portion to return said separation and control means to said first position, said predetermined length and said predetermined angle being preselected to allow successive balls to be released from said track portion with said predetermined time interval therebetween;

said ball retention and discharge means including a ball outlet operatively connected to said ball supply means, said ball outlet being a stationary elongated generally linear track generally semi-circular in cross-section and having a slot therein, said slot extending substantially the entire length of said track and receiving said cam portion, said track portion being moveable within said slot at a location remote from where said cam portion moves into said slot and away from said ball supply means, and said track portion having ball slow-down means on its upper surface adapted to slow down a ball traveling therealong.

4,132,215

BOW STRING RELEASE MECHANISM

Glenn A. Burton, 1103 Biscayne Dr., Little Rock, Ark. 72207

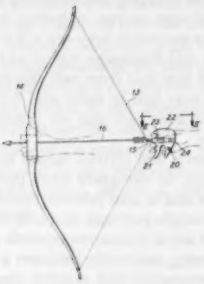
Filed May 31, 1977, Ser. No. 801,658

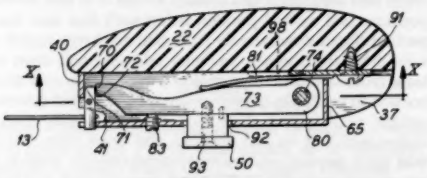
Int. Cl.[2] F41B *5/00*

U.S. Cl. 124—35 A **2 Claims**

1. A bow string holder and release device for use in archery comprising: a formed grip member having opposed first and second sides and opposed front and back edges interconnecting the sides, the grip member dimensioned to be received in the palm of a user's hand with the fingers of the user overlying a front edge of the grip member and a back edge of the grip member positioned between the fingers and a base of the thumb with a thumb overlying a first side of the grip member, the fingers extending along a second side of the grip member opposite the first side, a latch device carried by the grip member having a bow string engaging member adjacent the front edge of the grip and a trigger release button projecting from the first side of the grip member and underlying the thumb the latch device adopted to grip a bow string parallel to the first and second sides, the latch device including a housing separate

from the grip member received in a slot extending along the first side of the grip member open to the front edge of the grip member, the housing having spaced apart side walls with aligned grooves therein open to an end of the side walls at the front edge of the grip member, a pivotable member spanning the area between the side walls in the area of the aligned grooves closing off the grooves when in a latched position and opening the grooves when pivoted from the latched position to a release position, a pivotable latch carried within said housing





having an end face engageable with the pivotable member to prevent pivoting from the latched to the release position, the latch pivotable out of contact with the pivotable member by movement against a spring, and a trigger button projecting from the housing attached to the latch on a side opposite engagement of the spring whereby the trigger button can be depressed moving the latch against the spring to release the pivotable member to open the grooves, the grooves dimensioned to receive a bow string when the pivotable member is in the latched position.

4,132,216

TWO-ZONE HOT AIR OVEN FOR FOOD-LOADED CARTRIDGES

Raul Guibert, 8343 W. 4th St., Los Angeles, Calif. 90048

Continuation-in-part of Ser. No. 776,772, Mar. 11, 1977. This application Jun. 24, 1977, Ser. No. 809,775

Int. Cl.[2] A47G *23/04*

U.S. Cl. 126—261 **8 Claims**

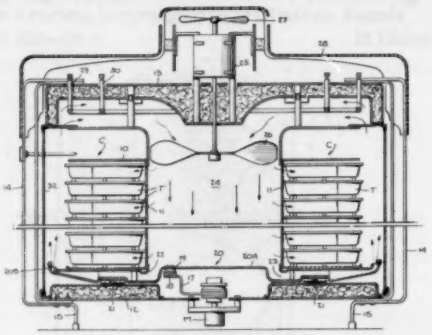
1. A hot-air oven for heating pre-cooked meals which are initially cold to an elevated service temperature level suitable for diners, said oven comprising:

A. an annular array of cartridges each formed by an open carton whose walls have holes therein and a stack of trays containing said pre-cooked meals nested in said carton, the carton walls of said array defining the boundary of a hollow center core;

B. means including a heater assembly to circulate heated air through said core, through a flow restriction and then around said array of cartridges to produce a toroidal air flow pattern enveloping said array, a portion of the heated air in said core being forced by said restriction to pass through the holes of the carton to heat the food in the trays;

C. means to continuously rotate said array about said core; and

D. an arcuate shield conforming to the boundary of said core to block the flow of heated air into said carton holes and to effectively divide said oven into a hot zone which includes said shield and a non-shielded extra-hot zone whereby during each cycle of rotation in the course of a heat-up phase, the trays in each carton pass successively through said zones, the temperature in said extra-hot zone



being well above said service temperature level whereby the rate of heat transfer, which depends on the temperature differential between the existing food temperature and the heating temperature, remains rapid throughout the course of raising the food temperature from its initial to its elevated service temperature level.

4,132,217

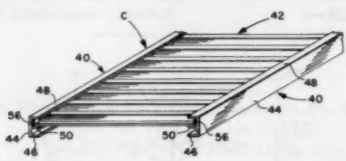
SOLAR AIR HEAT COLLECTOR

Frank E. Rom, Avon Lake, and Carl J. Wenzler, North Ridgeville, both of Ohio, assignors to Solar Energy Products Company, Avon Lake, Ohio

Filed May 27, 1977, Ser. No. 801,100

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—270 **21 Claims**



1. A solar heat absorber assembly for a solar air heater or the like comprising: a pair of elongated spaced-apart parallel side rails having main web portions and being of substantially the same size and shape, each said rail having a mounting flange extending from one longitudinal edge of said web portion thereof inwardly toward the other rail, said flanges being integral with said web portions and extending along substantially the full length thereof, a continuous absorber panel spanning said web portions adjacent the other longitudinal edges thereof, said absorber panel being of a material having a high thermal conductivity and being highly absorptive of solar energy, and said panel being corrugated along substantially the full length thereof with corrugations extending in a direction across said side rails.

4,132,218
VACUUM PANEL

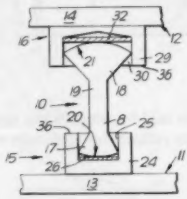
Christopher J. Bennett, Little Stratton, Moor Hall Lane, Danbury, Essex, England CM3 4ER

Filed Dec. 7, 1977, Ser. No. 858,219

Claims priority, application United Kingdom, Dec. 10, 1976, 51724/76

Int. Cl.² F24J 3/02

U.S. Cl. 126—270 **21 Claims**



1. A panel intended for use as a vacuum enclosure, comprising a pair of spaced sheets defining between them opposite walls of said enclosure, a plurality of spacer assemblies located between said sheets and adapted to maintain said sheets at the desired spacing, each of said spacer assemblies comprising a pair of bearing elements positioned on the inside surfaces of said sheets at mutually opposite locations, a spacer element received between said bearing elements which spacer element is formed with substantially spherical bearing surfaces cooperating with said bearing elements, and spring means incorporated within each said spacer assembly adapted to allow a limited degree of relative movement of said sheets in a direction substantially at right angles to the plane of said sheets.

12. A panel as claimed in claim 1, wherein edge sealing means comprising an edge sealing element supported by a peripheral wall member are provided extending between the bounding edges of said spaced sheets, said sealing element includes flanged side portions in fluid-tight relationship with the inner peripheral areas of said sheets and a wall portion extending between said sheets.

17. A panel as claimed in claim 12, wherein the space defined between said sheets is maintained at reduced pressure and a vacuum port is provided through which the reduced pressure is applied.

18. A panel as claimed in claim 17, incorporating a solar heating element located in said space.

4,132,219
EXTRA-FOCAL, CONVECTIVE SUPPRESSING SOLAR COLLECTOR

Jeffrey M. Cohen, and Marion D. Cohen, both of Parkway House, 2201 Pennsylvania Ave., Philadelphia, Pa. 19130

Continuation-in-part of Ser. No. 674,060, Apr. 5, 1976, Pat. No. 4,022,188. This application Apr. 22, 1977, Ser. No. 789,793

Int. Cl.² F24J 3/02

U.S. Cl. 126—270 **7 Claims**

1. A radiant solar energy collection apparatus for suppressing convective loss, comprising:

(a) an absorption means for absorbing solar radiation while minimizing said convective loss, said means comprising:

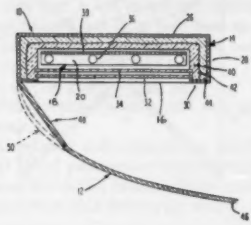
(i) an outer shell defining a substantially imperforate downwardly directed cavity and an aperture extending across at least a portion of the lower surface of said cavity;

(ii) a substantially horizontal absorber means, disposed within said cavity for absorbing incident radiant energy collected within said cavity;

(iii) insulation means for insulating at least a portion of said cavity, for preventing the transmission of energy therethrough, said means surrounding substantially all portions of said absorber on the top and all sides of said absorber, and extending downwardly below said absorber to at least intersect a substantially horizontal plane spaced below and apart from said absorber; and

(iv) sheet means disposed below said absorber and within said cavity in said substantially horizontal plane to close said absorber within at least a portion of said cavity;

(b) an elongate reflecting element fixedly mounted with repsect to said absorption means having a generally parabolic cross-section, said cross-section extending substantially from the vertex of the parabola defined thereby to a



point remote from said vertex, said element being disposed substantially beneath said absorption means for directing radiant solar energy upwardly into said cavity through said aperture, said aperture being disposed generally adjacent to the axis of said parabolic cross-section and extending beginning at about the focal point thereof for a preselected distance outwardly along said axis, to collect substantially all of said energy which passes through said axis between said focal point and said preselected outward point along said axis.

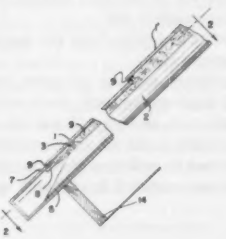
4,132,220
SOLAR ENERGY COLLECTOR

Harry E. Thomason, 6802 Walker Mill Rd., SE., Washington, D.C. 20027

Filed May 4, 1976, Ser. No. 682,968

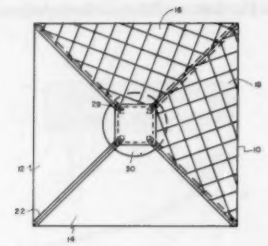
Int. Cl.² F24J 3/02

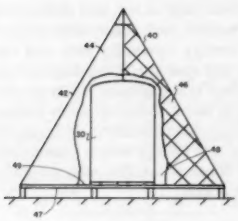
U.S. Cl. 126—271 **5 Claims**



1. Solar heat collector apparatus comprising a substantially rigid solar absorber, substantially transparent glazing material above said absorber to admit solar energy to said absorber for conversion to heat energy, a flexible adhesive material forming support means, said glazing material being supported substantially entirely by said absorber through said support means, said adhesive material comprising a bonding type of material serving as the only means to secure said glazing material to said substantially rigid absorber, and said flexible adhesive material serving as a spacer to prevent direct contact and to allow for movement due to unequal expansion and contraction between said glazing and said substantially rigid absorber to minimize damage to said absorber and glazing due to expansion and contraction as a result of temperature cycling and heat extremes in said apparatus, said absorber and adhesive material assisting in support of said glazing and said glazing lending strength to said absorber in sandwich-like fashion.

4,132,221
PYRAMIDAL SOLAR HEATING SYSTEM
Alfred G. Orillion, 1201-E Cleermont Cir., Huntsville, Ala. 35801
Filed May 26, 1977, Ser. No. 800,745
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **9 Claims**

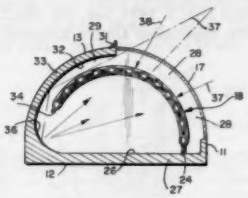




1. A solar heater comprising:
a pyramidal enclosure;
the wall of the enclosure, extending approximately one-half way around the enclosure, and a base of the enclosure having a reflective coating on inner sides, and approximately the balance of the wall surface of the enclosure being light transmissive; and
a tank positioned on and rising from the central region of the base of said enclosure;
whereby a significant amount of solar radiation passing through said light transmissive wall surface would directly strike the tank, and a significant amount of radiation would also initially strike the inner reflective surfaces of the enclosure and be reflected onto the tank, and by this combination, any material in the tank quite effectively heated.

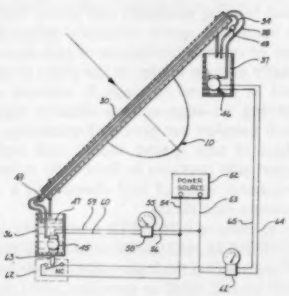
4,132,222
SOLAR ENERGY COLLECTOR
Charles F. Roark, 24 Maple La., Brownsburg, Ind. 46112
Filed Aug. 18, 1976, Ser. No. 715,448
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **7 Claims**

1. A solar energy collector comprising:
an absorber panel having a plurality of passageways therein for conveying a working fluid therethrough, said panel being semicylindrical about a horizontal axis and having an outwardly facing convex face and a concave face concentric therewith;
a housing enclosing said panel and having a window therein for exposing a substantial area of the convex face directly to sunlight, said window being part cylindrical about said horizontal axis; and



reflector means in said housing facing said window and said concave face to reflect sunlight onto said concave face.

4,132,223
TRACKING SYSTEM FOR SOLAR ENERGY COLLECTOR
E. Garland Reddell, 115 E. 26th St., Yuma, Ariz. 85364
Filed Sep. 6, 1977, Ser. No. 830,757
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **10 Claims**

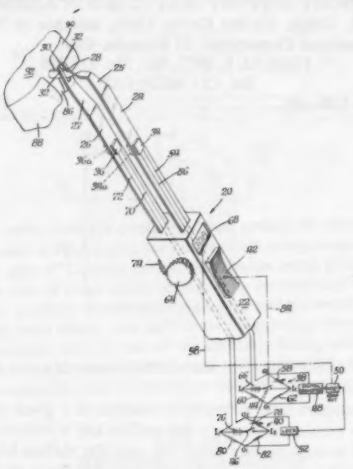


1. A solar tracking system for maintaining a solar energy reflecting surface generally oriented toward the sun to reflect solar energy to a heat exchanger, said tracking system comprising in combination:
a. a trough shaped solar energy reflector for reflecting solar energy to the heat exchanger, said trough having a longitudinal axis and a lateral axis;
b. means for pivotally mounting said trough parallel to its longitudinal axis;
c. support means extending lateral to said trough;
d. a first container supported from said support means at one side of said trough for containing a liquid;
e. a second container supported from said support means at another side of said trough for containing the liquid;
f. conduit means for conveying the liquid intermediate said first and second containers;
g. pump means for pumping the liquid through said conduit means; and
h. energizing means for energizing the operation of said pump means;
whereby, transfer of the liquid from one to another of said first and second containers produces an imbalance about the pivotal axis of said trough and results in pivotal movement of said trough to maintain the reflecting surface generally oriented toward the sun and continually directs solar energy upon the heat exchanger.

4,132,224
DUROMETER FOR INDENTIBLE TISSUE AND THE LIKE

Robert G. Randolph, 4146 Howard Ave., Western Springs, Ill. 60558

Filed Jan. 12, 1977, Ser. No. 758,653
Int. Cl.[2] A61B 5/10
U.S. Cl. 128—2 S 16 Claims



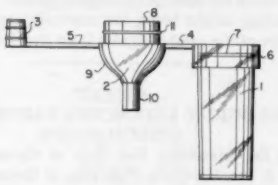
1. A durometer for indentible tissue and the like comprising:
a movable handle having first and second spaced normally parallel flexible beams extending therefrom and terminating in free ends;
the first beam having a tissue-engageable indentor;
the second beam having a tissue engaging surface adjacent its free end;
said indentor extending laterally from the free end of the first beam past the tissue engaging surface of the second beam when the beams are in such normally parallel relation;
first sensing means for determining the magnitude of flexure of the first beam relative to the other beam when the indentor is pressed into tissue;
indicator means operable in response to signals from the sensing means including read-out means for displaying readings and indicative of increasing magnitudes of flexure of the first beam by movement of the handle to press the indentor into tissue;
second sensing means responsive to initial contact of the second beam with tissue adjacent the indentor to generate a lock signal; and
lock means responsive to the lock signal to lock the reading displayed by the indicator means at the time of such initial contact of the second beam with tissue.

4,132,225
MICRO BLOOD COLLECTOR

George F. Whattam, Timonium, Md., assignor to Hynson, Westcott & Dunning, Inc., Baltimore, Md.

Filed Nov. 18, 1976, Ser. No. 742,744
Int. Cl.[2] A61B 10/00
U.S. Cl. 128—2 F 2 Claims

2. Apparatus for bleeding an animal and containing the drawn blood for transport to a testing facility comprising
a one piece, high density, flexible plastic molding including
a hollow, generally cylindrical base having a closed bottom end, an open top end, and one element of a groove-and-ridge combination near said open top end, said base being collapsible upon application of a squeezing force to reduce the internal volume thereof;
a first strap extending laterally from said base at a location near said top end of said base;
a top integral with that end of said first strap remote from said base said top having
an enlarged first end portion with the other element of said groove-and-ridge combination thereon, said first end being of a size adapting it for cooperation with the open top end of said base to form a snap fit between said base and top, such snap fit being secure enough to prevent said top from popping off said base when said base is collapsed but releasable to permit removal of said top from said base so as to provide ready access to the contents of said base through the entire open top end of said base.
a smaller second end portion, and
a connecting portion joining said first and second end portions,
said first, second and connecting portions having a vertical blood passageway therethrough;
a second strap extending laterally from said top at a location spaced from said first strap; and



a cap integral with that end of said second strap remote from said top said cap having
a closed end,
an open end, and
a generally tubular wall of a size adapted to fit over the exterior surface of the smaller end portion of said top and form a press fit therewith;
said base, top and cap being permanently connected together by said straps to prevent loss and maintain the same in position for ready cooperation with one another upon flexing of said straps to permit relative movements of said base, top and cap; and
a hypodermic needle unit providing a hollow needle portion and a hub part having an internal diameter adapting it for a tight fit on said smaller end portion of said top; whereby the drawn blood may be secured in said base for transport by removal of said needle unit and assembling said cap on said top; and whereby access to clotted blood components in said base may be gained by removal of said top from said base.

4,132,226
BIOPOTENTIAL MOVEMENT ARTIFACT INHIBITING SYSTEM

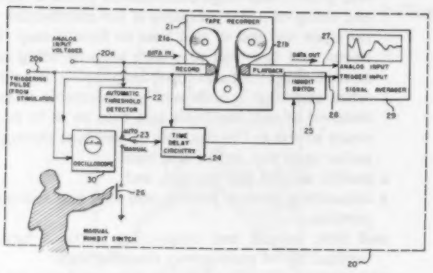
Robert L. Seeley, and William F. Flanigan, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 13, 1977, Ser. No. 815,327
Int. Cl.[2] A61B 5/04
U.S. Cl. 128—2.1 R 10 Claims

1. An apparatus for differentiating evoked analog potentials representative of evoked responses to audio stimuli by a marine mammal from movement analog potentials representative of the movement artifact comprising:
means coupled to receive all of the analog potentials from the marine mammal for storing them a predetermined time;
means coupled to receive all of the analog potentials for generating inhibit signals when their magnitudes exceed a predetermined threshold;

means coupled to the generating means for delaying the inhibit signals a period equal to the predetermined time of the storing means;

means connected to the delaying means and to the storage



means and operative on the playback output of the storage means for inhibiting the transmission of the stored potentials upon the receipt of inhibit signals, the transmission inhibiting means being automatically actuated upon the receipt of the inhibit signals from the delaying means.

4,132,227

UROLOGICAL ENDOSCOPE PARTICULARLY RESECTOSCOPE

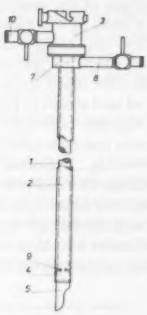
Wolfgang Ibe, Hamburg, Fed. Rep. of Germany, assignor to Winter & Ibe, Hamburg, Fed. Rep. of Germany

Continuation of Ser. No. 602,400, Aug. 6, 1975, abandoned. This application Jul. 1, 1977, Ser. No. 812,177

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1974, 7426959[U]

Int. Cl.[2] A61B *1/00*

U.S. Cl. 128—4 **6 Claims**



6. A urological endoscope, comprising, in combination, a hollow cylindrical sheath having a proximal end and a distal end, said sheath comprising a beak at its distal end; optical viewing means in said sheath extending from said distal end back towards said proximal end; a removable slide-on outflow tube slidable onto the sheath to surround said sheath and forming together with said sheath, when slid into place around said sheath, an intermediate return-flow space between the outer wall of said sheath and the inner wall of said slide-on outflow tube, said outflow tube when in position over said sheath tightly surrounding said distal end of said sheath; means for introducing clear rinsing water into the proximal end of said sheath; and means for withdrawing turbid water from the proximal end of said intermediate space, said outflow tube being provided with apertures at the distal end thereof, said apertures opening directly into said intermediate space for the flow of clear rinsing water out of the distal end of said sheath and around the end of the endoscope and then through said apertures directly into said intermediate space.

4,132,228

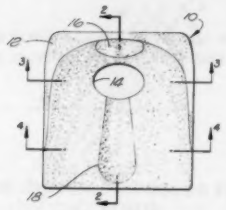
COMFORT SUPPORT SEAT CUSHION ASSEMBLY

James A. Green, Garden Grove, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 8, 1977, Ser. No. 813,918

Int. Cl.[2] A61H *1/00*

U.S. Cl. 128—33 **13 Claims**



1. A comfort support seat cushion assembly for a human body comprising:

(a) a support layer of resilient material of a given compression resistance having a top surface and a bottom surface, said bottom surface being flat, said top surface being contoured to slope inwardly and downwardly to form a forward-facing depression, said contouring providing an even pressure distribution on the gluteal region of a person seated on the assembly, said support layer having a hole therethrough, said hole providing pressure relief for the ischial tuberosities of a person seated on the assembly, said upper surface having a contoured groove extending from said hole toward the foward edge of said support layer, said groove providing pressure relief for the perineum of a person seated on the assembly, a recess positioned in said top surface rearwardly of said hole, a resilient insert having a compression resistance less than said given compression resistance being provided in said recess, said insert being contoured to match said upper surface contouring, said insert providing pressure relief to the coccyx of a person seated on the assembly;

(b) a comfort layer of resilient foam material of a compression resistance less than said given compression resistance, said comfort layer being the same general size and shape as said support layer and being evenly positioned on top of said support layer, said comfort layer having a substantially uniform thickness;

(c) a weight distribution layer of resilient foam material of a compression resistance less than said compression resistance of said comfort layer, said weight distribution layer being of the same general size and shape of said support layer and being evenly positioned on top of said comfort layer, said weight distribution layer having a hole therethrough providing a pressure relieving recess for the perineum of a person seated on the assembly, said weight distribution layer having a substantially uniform thickness; and

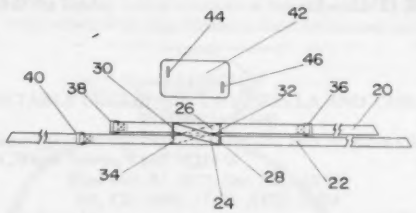
(d) a ventilation layer having two layers of woven, porous cloth and a plurality of woven, porous, semi-rigid tubes sandwiched between said layers of woven porous cloth and spaced parallel in a transverse direction along the assembly, said ventilation layer being of the same general size and shape as said support layer and positioned evenly on top of said weight distribution layer, said ventilation layer providing relief to temperature increase and water vapor build-up in the assembly.

4,132,229

SAFETY BELT FOR RESTRAINING BED PATIENTS

Robert D. Morrison, Columbus, Ohio, assignor to Morrison Medical Products Company, Columbus, Ohio

Filed Jul. 28, 1977, Ser. No. 819,714
Int. Cl.[2] A61F *13/00*
U.S. Cl. 128—134 **7 Claims**



1. A safety belt for confining a bed patient to relatively free movement within limits, said safety belt comprising:

(a) a pair of laterally offset, flexible, securing straps; and

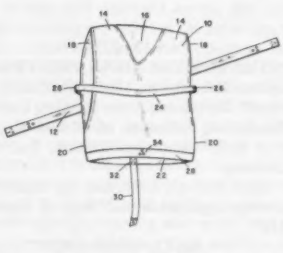
(b) a pair of cross straps transversely intersecting intermediate portions of said securing straps and transversely crossing each other, one said cross strap being attached at its opposite ends to two of the similarly facing sides of each securing strap and the other of said cross straps attached at its opposite ends to the other sides of said securing straps.

4,132,230

RESTRAINING GARMENT

James T. Ladd, 500 S. Broadway, Portland, Tenn. 37148

Filed Aug. 23, 1977, Ser. No. 827,188
Int. Cl.[2] A61F *13/00*
U.S. Cl. 128—134 **3 Claims**



1. A restraining garment for comfortably confining and securing a person to a bed, chair, or other supporting structure, said device comprising:

a. A vest member disposed around the upper torso of a subject, having interconnected front and back portions which comfortably and securely contact the respective front and back portions of the subject wearing said vest member;

b. A first transverse strap disposed around the thorax of the subject for support and integrally attached to the front portion of the vest member for reinforcement and forming a first loop at the back portion of the vest member;

c. A second transverse strap at the bottom hem of said vest member, disposed around the waist of the subject for support and integrally attached to the vest member for reinforcement;

d. An elongated strap, having sufficient length to be positioned between the bed, chair, or other supporting structure and the back of the subject, having detachable coupling means at each end, said means being spatially disposed between the ends of said strap, its midpoint, and each other, so that by tightly wrapping the free ends of said strap about the frame of the bed, chair, or other supporting structure, after the said strap has been slidably received by the first loop formed at the rear of the vest member by the first transverse strap and the back portion of the vest member, and connected to said vest member by means of the first loop slidably being received by a smaller, second loop located in the center of the elongated strap and fixedly attached at both ends to the underside of the said strap, and by adjoining the coupling means located at each end of the elongated strap, the subject is confined to the approximate center of the bed, chair, or other supporting structure; and

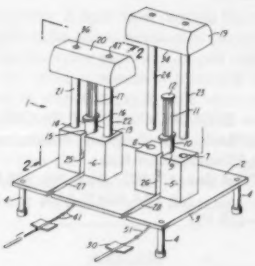
e. A crotch strap of sufficient length to extend between the thighs of the subject and having one end fixedly attached to the second transverse strap at the rear midpoint of the vest member, and one end detachably coupled to the second transverse strap at the front midpoint of the vest member by detachable coupling means.

4,132,231

INJECTION DEVICE

Vincent Puccio, 245 N. Cresta Ave., North San Gabriel, Calif. 91775

Filed May 20, 1977, Ser. No. 798,795
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—218 A **8 Claims**



1. An injection device comprising base means and block means joined in upright posture to said base means, said block means including at least one passage means in said block means for receiving and holding at least one syringe therein, said syringe holding passage means including means for preventing passage of the syringe completely therethrough, but for permitting passage therethrough of means of smaller cross-sectional area than the syringe, and weight means comprising a mass of predetermined weight for exerting pressure on the plunger of said syringe, said weight means including guiding means received in guide passage means in said block means for directing the force of the weight means by gravity alone continuously upon said plunger, said guiding means comprising at least one rod adapted to pass sufficiently far into said guide passage means to permit said mass to depress the plunger of said syringe, and said syringe holding passage means and the base means including slot means for permitting passage of means joined to the syringe through said base means and through said block means into said syringe holding passage means.

4,132,232

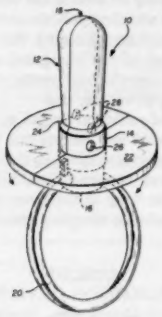
INTEGRALLY MOLDED PACIFIER FOR INFANTS

Robert Lerner, East Hills, N.Y., assignor to Formulette Co., Inc., Long Island City, N.Y.

Filed Jun. 1, 1977, Ser. No. 802,589
Int. Cl.[2] A61J *17/00*
U.S. Cl. 128—360 **7 Claims**

1. A pacifier for infants comprising a hollow nipple open at one end and closed at its other end, a guard member secured about the perimeter of the nipple adjacent its open end and extending in a plane transverse to the axis of the nipple, said

nipple having a base portion adjacent said guard member provided with a region of increased wall thickness at least on the side of said guard member from which said stem extends,



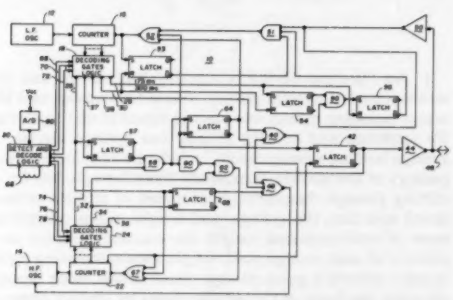
said base portion terminating in an annular shoulder on said stem side of the guard member and at least one aperture formed in the wall of said stem between the guard member and the closed end thereof.

4,132,233

DIGITAL CARDIAC PACER

Jerome T. Hartlaub, New Brighton, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Jun. 13, 1977, Ser. No. 805,885
Int. Cl.[2] A61N *1/36*
U.S. Cl. 128—419 PG **7 Claims**



1. In a digital pulse generator used in conjunction with a lead coupled between said pulse generator and a subject's heart, and including a counter which is incremented at a given rate, means responsive to said counter having been incremented to a certain value for providing a first signal to said counter for resetting said counter, said first signal further being provided to means for providing a stimulating pulse over said lead to cause said heart to contract, and sensing means for providing a signal manifesting the sensed contraction of said heart, said sensing means signal being applied to reset said counter, the improvement of a refractory circuit comprising:

first means for providing a refractory signal in response to said counter having been incremented to a count manifesting a refractory time; and

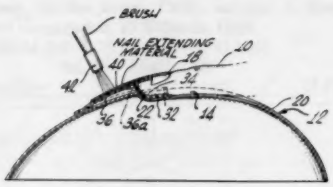
second means responsive to the signals resetting said counter and said refractory signal for preventing said sensing means signal from resetting said counter from the time said counter is once reset until said refractory signal is provided.

4,132,234

METHOD AND APPARATUS FOR PRODUCING EXTENDED-LENGTH FINGERNAILS

Marianne Bradley, 1136 S. Shenandoah, Los Angeles, Calif. 90035

Filed Jan. 31, 1977, Ser. No. 763,727
Int. Cl.[2] A45D *29/00*
U.S. Cl. 132—73 **6 Claims**



1. Apparatus for producing extended-length fingernails, comprising:

a finger supporting block locatable on a firm work surface and shaped to receive a finger and retain it in a relatively stable position;

at least one removable form having a rigid convex surface closely corresponding to the contours of a relatively long fingernail, said convex surface having a curvilinear ledge shaped to fit under the fingernail when the finger is resting on said block and providing a rigid under-surface for the application of nail-extending material; and

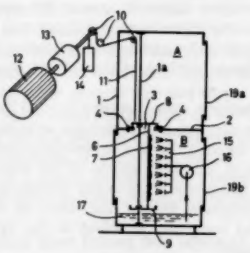
means for positively locating said form on said block.

4,132,235

APPARATUS FOR TREATING PRINTING PLATES

Eckhard Koplin, Birkenheide; Horst Hoffmann, Wachenheim; Siegfried Raiff, Weinheim; Peter Richter, Ludwigshafen, and Helmut Kaufmann, Reilingen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 15, 1977, Ser. No. 860,871
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1976, 2657558
Int. Cl.[2] B08B *3/02*
U.S. Cl. 134—99 **5 Claims**



1. An apparatus for treating photopolymer printing plates, comprising a printing plate holder which can travel in a controlled manner between a closable loading and unloading chamber and an adjoining treatment chamber, a battery of nozzles located in the treatment chamber, for the directionally controlled application of a treatment medium and of a rinsing

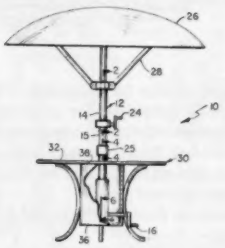
medium, and corresponding tanks and collecting troughs, located within the chambers, for the liquid treatment media, wherein the loading and unloading chamber and the treatment chamber are arranged above on another and the holder, with the printing plate mounted on it, can be moved substantially vertically up and down through a slot in a partition between these two chambers, sealing of the slot, in the terminal positions of the holder, which is moved in the manner of an elevator, being effected by edge elements fixed on the said holder.

4,132,236

TILTABLE COLLAPSIBLE UMBRELLA AND TABLE COMBINATION

William Petersen, and Mary A. Petersen, both of 30209 Cheret Pl., Palos Verdes, Calif. 90274

Filed Oct. 31, 1977, Ser. No. 815,151
Int. Cl.[2] A45B *17/00*; A47B *37/04*
U.S. Cl. 135—16 **2 Claims**



1. In combination a collapsible umbrella and a table, said umbrella including a telescopic shaft and an openably closable umbrella cover, cranking means for telescoping said shaft and opening and closing said umbrella cover, said table having a central circular opening provided in the table top, a cylindrical open cannister registrable with said opening, said cranking means extending outside of said cannister, the entire umbrella and shaft fittable inside said cannister when collapsed, a removable circular cover providable for said opening, and said cover is in two semi-circular parts, said parts in turn defining a central opening for accommodation of said telescopic shaft when said umbrella is in the extended telescopic position; and

said shaft is in two parts, an upper part and a lower part—the lower end of said upper part terminating mergedly into a ball joint for tiltingly moving said upper part with respect to the upper end of said lower part, said lower end of said upper part loosely housed in a collar which threadingly engages the upper end of said lower part, said lower end of said upper part being springingly urgingly held stationarily in place whether tilted or upright.

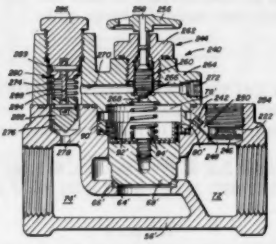
4,132,237

EXCESS FLOW SHUTOFF VALVE FOR HAZARDOUS FLUIDS

Garth P. Kennedy; William A. Kennedy, Jr.; Neal R. Kennedy, all of Oklahoma City, and John W. Elder, Tulsa, all of Okla., assignors to Corken Pump Company, Oklahoma City, Okla.

Filed May 3, 1976, Ser. No. 682,892
Int. Cl.[2] F16K *13/04, 17/40*; F04B *49/02*
U.S. Cl. 137—75 **10 Claims**

1. A shutoff valve for installation in a fluid flow line for controlling flow in the flow line, said valve comprising a valve body having an opening therein defining a valve seat, a valve member movably mounted in said body for movement between a closed position in engagement with the seat and an open position spaced therefrom, said valve body including an inlet volume on one side of the valve seat and valve member and an outlet volume on the other side thereof, said valve body including a cavity movably receiving the valve member and defining a volume isolated from the inlet volume and outlet volume, means sealing the valve member to the cavity while permitting movement in relation to the valve seat, spring means biasing said valve member towards the valve seat to close the valve member when the pressure in the cavity is balanced with or greater than the pressure in the inlet volume, restrictive orifice means communicating the cavity with the inlet volume to equalize pressures therein and a passageway communicating the cavity with the outlet volume to reduce pressure in the cavity when pressure in the outlet volume reduces during normal flow of fluid from the outlet volume



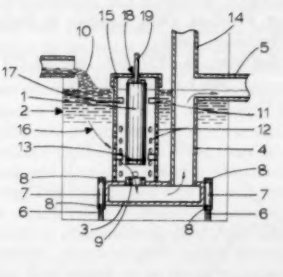
when the passageway is open thus causing the pressure of the inlet volume against the valve member to overcome the spring means and move the valve member to open position to enable flow through the valve, a manually operated valve means in said passageway in alignment with said valve member, and a temperature sensitive valve spaced from the valve means for interrupting communication between said cavity and said outlet volume to close the valve member if high temperature conditions occur, said heat sensitive valve being disposed adjacent the outlet volume to sense the temperature thereof.

4,132,238

AUTOMATIC SEPARATOR VALVE

Earl A. Clark, 1143 Manchester Ave., Norfolk, Va. 23508

Filed Apr. 29, 1977, Ser. No. 792,447
Int. Cl.[2] F16K *31/22*
U.S. Cl. 137—172 **10 Claims**



1. An automatic separator valve adapted to be installed in a containment into which a mixture of water and a fluid less dense than water flows through an inlet, said automatic separator valve being operable to separate said water from said mixture for subsequent discharge from said containment substantially free of said fluid less dense than water, comprising:

a conduit operationally positionable substantially adjacent the lowermost extremity of said containment provided with an upwardly opening orifice adapted to be closed by valve means, said conduit further being in fluid communication with a containment water discharge outlet;

a casing having a lower extremity interconnected with said conduit and surrounding said upwardly opening orifice, a lower portion of the height of said casing being perforated

to permit the flow of fluid thereinto from exteriorly thereof;

said containment water discharge outlet being substantially at the level of the upper extremity of an upper portion of the height of said casing and said containment inlet being at least as elevated as said containment water discharge outlet; and

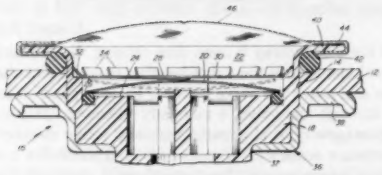
an operationally vertically movable float positioned within said casing, said float carrying a valve disc situated beneath the lowermost extremity thereof adapted to close said upwardly opening orifice when said float is at the lowermost extremity of the range of vertical movement thereof to prevent the flow of fluid into said conduit and said containment water discharge outlet.

4,132,239

FLUID VALVE FOR MICROWAVE DEVICES

Robert F. Bowen, Burlington, and Wesley W. Teich, Wayland, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Jul. 5, 1977, Ser. No. 813,040
Int. Cl.[2] G05D *23/02*; H05B *9/00*; A47J *31/00*
U.S. Cl. 137—382 **10 Claims**



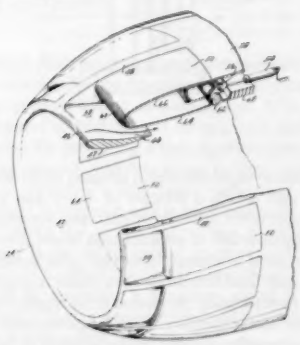
1. A valve assembly comprising a housing having a passage extending therethrough, thermally actuated means within the housing for opening and closing the passage to flow of a fluid therethrough, the housing having an outer circumferential portion designed to fit within an opening in a wall, and microwave field control means carried by said outer circumferential portion for preventing concentration of electrical fields in the area around said opening.

4,132,240

VARIABLE DOUBLE LIP QUIET INLET

John J. Frantz, Fairfield, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Mar. 28, 1977, Ser. No. 781,777
Int. Cl.[2] B64D *33/02*
U.S. Cl. 137—15.1 **5 Claims**



1. In a method of operating an aircraft gas turbine engine, the steps of:

passing substantially all of the required engine airflow through a fixed geometry forward inlet lip at a near-sonic average Mach number during engine approach power conditions, and

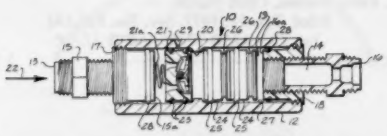
passing additional airflow through an inlet passage defined in part by a downstream variable position lip during higher engine power conditions.

4,132,241

FLOW CONTROL DEVICE

Frank M. Iannelli, Spartanburg, S.C., assignor to Tannetics, Inc., Erie, Pa.

Filed Oct. 13, 1976, Ser. No. 732,036
Int. Cl.[2] F16K *15/14*
U.S. Cl. 137—102 **9 Claims**



7. A flow control device for delivering a fluid flow in one direction only while providing for relief and venting of a backflow in an opposite direction, comprising:

an elongated housing having an inlet and outlet port;

an internal bore formed within said housing for delivering a fluid flow through said device;

an internal abutment formed within said housing extending into said bore;

self-contained check valve means disposed co-extensively across said bore for slidable movement between said inlet port and said internal abutment, said check valve means including an internal passageway having inlet and outlet openings and flexible diaphragm seal means carried therebetween for delivering a flow of fluid in said one direction while preventing a backflow of fluid in an opposite direction;

a vent opening formed in said housing between said internal abutment and said inlet port for venting the interior space defined by said bore with the atmosphere;

said check valve means including second seal means for covering and sealing said vent opening from direct communication with said internal bore when in a first position abutting said internal abutment;

said check valve means having a second position uncovering and placing said vent opening in direct communication with said bore to vent the interior space of said bore to the atmosphere should said backflow of fluid in said opposite direction exceed a predetermined pressure for effectively venting said backflow to the atmosphere; and

a resilient biasing means urging said check valve means against said internal abutment in said first position, said biasing means permitting said check valve means to move to said second position for venting of backflow while returning said check valve means by movement in said one direction to said first position once excess pressure has been vented so as to prevent fluid from being vented to the atmosphere thereafter.

4,132,242

CHEMICAL DISTRIBUTION SYSTEM

John D. Carroll, Jr., 182 Pleasant St., Paxton, Mass. 01612

Continuation of Ser. No. 660,457, Feb. 23, 1976, abandoned.
This application Nov. 21, 1977, Ser. No. 853,102
Int. Cl.[2] F17D *3/00*
U.S. Cl. 137—263 **6 Claims**

1. Chemical distribution system, comprising:

(a) a drum containing a body of chemical,

(b) a spring-support platen for supporting the drum which

issues a signal when the weight of the drum falls below a predetermined value,

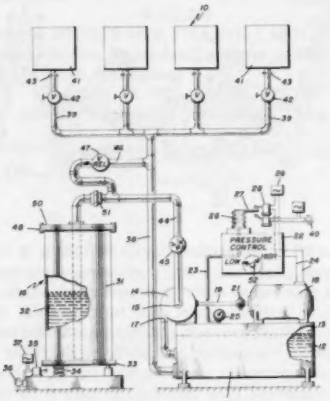
(c) a pressure tank containing a body of chemical and a pocket of air trapped in its upper portion above the body,

(d) a supply conduit, one end of which is connected to the lower portion of the pressure tank and the other end extends downwardly in the drum,

(e) a rotary pump connected to the supply conduit for pumping chemical from the drum to the pressure tank,

(f) a motor connected to the pump,

(g) a control connected on one hand to the pressure tank above the body of chemical to receive an indication of



pressure of the pocket of air and connected on the other hand to the motor for energizing it when the pressure in the pocket of air falls below a predetermined value,

(h) a pressure conduit connected on one end to the lower part of the pressure tank and at the other end to a plurality of secondary conduits, each leading to a washing machine, and

(i) a branch conduit from the pressure conduit to the supply conduit between the drum and the check valve, the branch conduit containing a pressure relief valve to return chemical to the drum if the pressure in the pressure conduit exceeds a predetermined value.

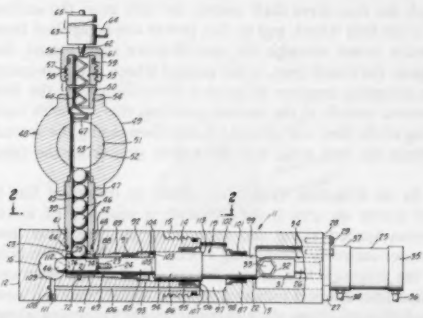
4,132,243

APPARATUS FOR FEEDING PERFORATION SEALER BALLS AND THE LIKE INTO WELL TREATING FLUID

Felix Kuus, Huntington Beach, Calif., assignor to BJ-Hughes Inc., Long Beach, Calif.

Filed Jun. 15, 1977, Ser. No. 806,795
Int. Cl.[2] F17D *1/00*
U.S. Cl. 137—268 **6 Claims**

1. Apparatus for feeding perforation sealer balls and the like into a stream of well treating fluid being pumped through a fluid flow line into a well, comprising a tube for receiving sealer balls, said tube having its inner end provided with port means communicating with the fluid flow line for the passage of sealer balls from the tube into the flow line, a plunger reciprocable in the tube for ejecting sealer balls from the tube into the fluid flow line, said plunger having an inwardly facing effective area subject to the pressure of the well treating fluid in said fluid flow line thereby producing a force biasing said plunger outwardly, piston means carried by said plunger, cooperating cylinder means in which said piston means is reciprocable, chamber means in communication with the outer end of said cylinder means, fluid conduit means communicating said chamber means with said fluid flow line, said piston means having an outwardly facing effective area exposed to the pressure of fluid in said chamber means thereby producing a force biasing said plunger inwardly, said inwardly facing effective area of said plunger being substantially equal in extent to said outwardly facing effective area of said piston means,



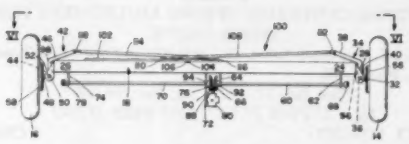
and means operatively associated with said plunger for reciproacting the same.

4,132,244

DRIVE MEANS FOR IRRIGATION SYSTEM

Lloyd C. Olson, Beaverton, and Gail Cornelius, Portland, both of Oreg., assignors to R. M. Wade & Co., Portland, Oreg.

Continuation of Ser. No. 663,259, Mar. 3, 1976, abandoned. This application Jun. 23, 1977, Ser. No. 809,572
Int. Cl.[2] B05B *3/18*
U.S. Cl. 137—344 **20 Claims**



1. In an irrigation system in which an irrigation line is moved across an area to be irrigated, a plurality of tower assemblies spaced along and supporting the irrigation line, each tower assembly comprising a beam positioned generally perpendicular to the irrigation line means interconnecting the beam and irrigation line, a first wheel pivotably mounted relative to the beam adjacent one end thereof, a second wheel pivotably mounted relative to the beam adjacent the other end thereof, the first and second wheels being pivotable to respective first positions generally perpendicular to the irrigation line to enable said irrigation line to be moved in a direction perpendicular to its length, and pivotable to respective second positions generally parallel to said line, first drive shaft means rotatably mounted along said beam and held for movement relative to said beam along the longitudinal axis of said first drive shaft means, motor means for rotating said first drive shaft means, a first gear secured in position to the first drive shaft means and rotatable therewith, a second gear rigidly secured in position relative to the first wheel so as to be non-movable in any direction relative thereto, the second gear being rotatable with the first wheel, second drive shaft means rotatably mounted along said beam and held for movement relative to said beam along the longitudinal axis of the second drive shaft means, the motor means for rotating said second drive shaft means, a third gear secured in position to the second drive shaft means and rotatable therewith, a fourth gear rigidly secured in position relative to the second wheel so as to be non-movable in any direction relative thereto, the fourth gear being rotatable with the second wheel, and actuator means, comprising an actuating member and means operatively coupling said actuating member and first and second wheels, for providing that movement of the actuating member in one direction pivots the first and second wheels to the first positions thereof with the pivoting of

the first and second wheels bringing the second and fourth gears into engagement with the first and third gears respectively so that power can be applied from the motor means through the first drive shaft means, the first gear, the second gear, to the first wheel, and so that power can be applied from the motor means through the second drive shaft means, the third gear, the fourth gear, to the second wheel, and movement of the actuating member in another direction pivots the first and second wheels to the second positions thereof, with such pivoting of the first and second wheels disengaging the second gear from the first gear, and the fourth gear from the third gear.

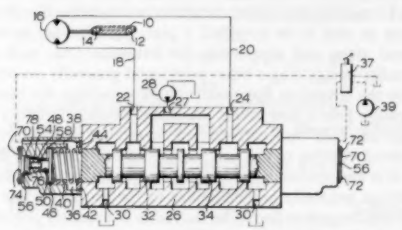
16. In an irrigation system in which an irrigation line is moved across an area to be irrigated, a plurality of tower assemblies spaced along and supporting the irrigation line, each tower assembly comprising a beam generally perpendicular to the irrigation line, means interconnecting the beam and irrigation line, a wheel mounted relative to the beam adjacent one end thereof, drive shaft means rotatably mounted along said beam and held for movement relative to said beam along the longitudinal axis of the drive shaft means, a first gear secured in position to the drive shaft means and rotatable therewith, a second gear rigidly secured in position relative to the wheel so as to be non-movable in any direction relative thereto, the second gear being rotatable with the wheel, the second gear being in engagement with the first gear with the axis of rotation of said wheel generally parallel to the irrigation line, with the respective axes of rotation of the first and second gears lying in the same horizontal plane.

4,132,245

EXTERNAL CENTERING SPRING ADJUSTMENT FOR A SPOOL VALVE

Howard L. Johnson, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 17, 1977, Ser. No. 760,069
Int. Cl.[2] F16K *27/08, 11/07;* F15B *13/042*
U.S. Cl. 137—377 **4 Claims**



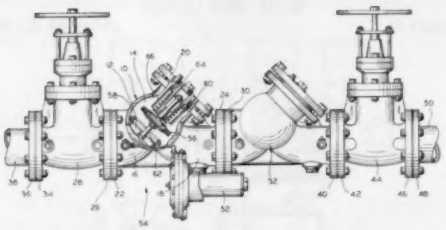
1. A pilot-operated spool valve comprising:
a valve body;
a bore in said body;
ports in said body and extending to said bore;
a spool in said bore and axially shiftable therein;
means defining at least one pilot associated with an end of said spool for applying a shifting force to said spool;
biasing means in said body for applying a biasing force to said spool;
means for adjusting the biasing means comprising a rotatable and axially movable member received in said body and engaging said biasing means, cam means on said member and said body for axially moving said member in response to rotation thereof, a rotatable actuator for rotating said member, means mounting said actuator only for rotation and restraining said actuator against axial movement, and an axially extendable connection between said actuator and said member; and
a nonrotatable, axially movable clamp means for clamping said actuator in a desired position of rotary adjustment including a plate abutting said actuator, said plate being non rotatable during adjustment of said biasing means.

4,132,246

BACKFLOW PREVENTION DEVICES

Robert A. Frisen, Rolling Meadows, Ill., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jul. 30, 1976, Ser. No. 710,284
Int. Cl.[2] F16K *15/06*
U.S. Cl. 137—536 **11 Claims**



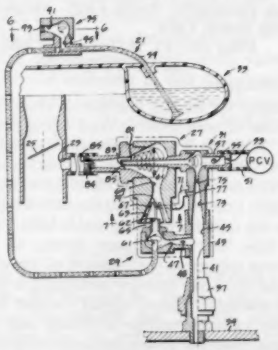
1. In a backflow prevention device including at least one spring operated check valve communicatingly interconnected with an inlet pipe and an outlet pipe, said check valve controlling fluid flow from said inlet pipe to said outlet pipe and preventing backflow from said outlet pipe into said inlet pipe, the improvement comprising means affixed about the circumference of said spring for shielding said spring in said check valve from transverse flow disturbances caused by said fluid flow to reduce pressure loss in said valve at rated flow and to eliminate clatter of said spring resulting from collision of adjacent turns of said spring caused by fluid flow through the spring windings, said shielding means having a length greater than about 40% of the extended length of said spring when said valve is in its closed condition, and means for limiting the movement of said check valve such that said shielding means extends over less than about 90% of the extended length of said spring when said valve is in its fully opened condition.

4,132,247

FLUID MIXING APPARATUS

John E. Lindberg, Berkeley, Calif., assignor to Owen, Wickersham & Erickson, San Francisco, Calif.

Filed May 4, 1977, Ser. No. 793,601
Int. Cl.[2] F15C *1/16*
U.S. Cl. 137—806 **10 Claims**



1. A fluid mixing apparatus for introducing a controlled amount of gas into a liquid flowing through a conduit, said fluid mixing mechanism comprising

a liquid carrying conduit,

variable impedance flow control means for producing a variable impedance to fluid flow through the control means which impedance varies in a non-linear relationship to the pressure differential across the flow control means and to an acceleration of the flow through the control means,

outlet means connecting an outlet of the variable impedance control means to the interior of the liquid carrying conduit, and

input means for supplying gas to a gas inlet of the variable impedance control means.

4,132,248

WINDING DEVICE FOR FILLING-YARN BOBBINS

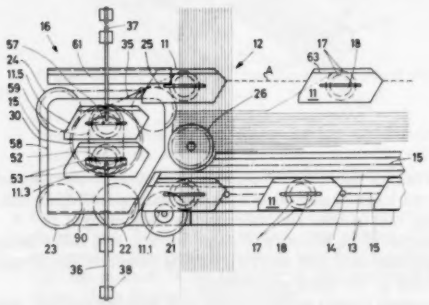
Alois Steiner, Rieden, Switzerland, assignor to Ruti Machinery Works Ltd., Ruti, Switzerland

Filed Aug. 19, 1977, Ser. No. 826,267

Claims priority, application Switzerland, Aug. 20, 1976, 10602/76

Int. Cl.[2] D03D *47/35*

U.S. Cl. 139—436 **13 Claims**



1. A winding device for the filling-yarn bobbins of shuttles of a multi-shed loom, having a filling station which has a yarn guide which rotates on a circular path and conducts a filling yarn, and a first means for the successive moving of the empty bobbins into the plane of the circle defined by the rotation of the yarn guide, characterized by a second means for the successive moving of filled bobbins out of the said plane, means controlling said first and second means as that immediately before a filled bobbin is moved out of the said plane an empty bobbin is moved into it, and both said bobbins are simultaneously in said plane during a time interval shorter than a single revolution of the yarn guide.

4,132,249

WEFT SELECTION AND RETENTION MECHANISM FOR SHUTTLELESS LOOMS

D. Anselmo Bolea Camprubi, Barcelona, Spain, assignor to Incotex S.A., Barcelona, Spain

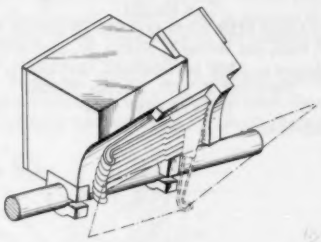
Continuation-in-part of Ser. No. 531,773, Dec. 11, 1974. This application Aug. 27, 1976, Ser. No. 718,160

Claims priority, application Spain, Dec. 18, 1973, 198.918; Dec. 18, 1973, 198.920

Int. Cl.[2] D03D *47/38, 47/12*

U.S. Cl. 139—453 **5 Claims**

1. Apparatus for selection of weft threads in looms operating without a shuttle comprising a plurality of weft selector arms each having a first end in engagement with a weft thread and a second end, means pivotally mounting each of said arms at a point intermediate said first and second ends, with said plurality of arms arranged to have said first end of each arm pass through a common point during pivotal movement about said intermediate point, pawl means pivotally mounted on said second ends of said selector arms, reciprocating drive means, and electro magnetic selector means for selectively pivoting said pawl means into driving engagement with said reciprocating drive means for selectively individually pivoting each of said arms, with pivotal motion of said arms as a result of selective engagement of said pawl means with said drive means operating to effect selection of a weft thread in engagement with said first end of said selected arm.



4,132,250

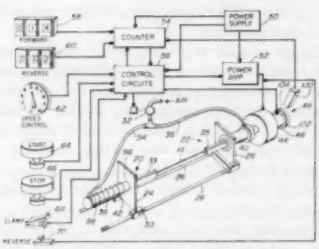
WIRE TWISTING SYSTEM

William T. Brown, North Andover; Robert J. Moran, Littleton, and Larry M. LeBlanc, Nabnasset, all of Mass., assignors to Alphatron Incorporated, North Andover, Mass.

Filed Jun. 27, 1977, Ser. No. 810,085

Int. Cl.[2] B21F *7/00*

U.S. Cl. 140—115 **8 Claims**



1. Apparatus for twisting together two or more wires of substantially equal length, comprising

(a) a pair of spaced axially aligned and oppositely facing chucks

(b) one of said chucks being mounted for rotation about its axis,

(c) the other of said chucks being fixed against rotation,

(d) actuating means connected to said chucks for closing and opening said chucks whereby the ends of wires placed in said chucks may be gripped and released,

(e) driving means connected to said one chuck for driving rotation thereof, and,

(f) numerically adjustable control means connected to said driving means for rotating said one chuck in one direction for a pre-selected number of turns and then in a reverse direction for a pre-selected number of turns,

(g) at least one of said chucks being mounted for limited axial movement to compensate for the shortening of wires as they are twisted,

(h) spring means operatively connected to said axially moveable chuck to provide a counterforce thereto,

(i) braking means connected to said one chuck for stopping said one chuck at the end of a twisting cycle,

(j) said control means including manually adjustable forward and reverse digital switches, counting means connected to said switches, and rotation detecting means connected to

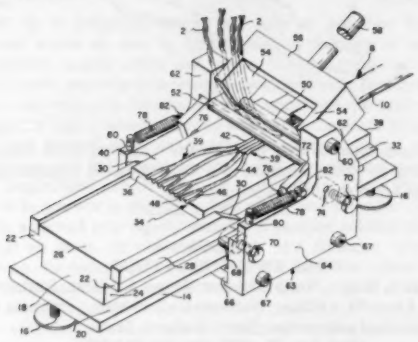
said counting means and responsive to rotation of said one chuck for correlating the number of turns of said chuck with the numbers on said switches.

4,132,251

APPARATUS FOR DEPLOYING TWISTED WIRES

Kenneth F. Folk, and Walter C. Shatto, Jr., both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 3, 1977, Ser. No. 839,149
Int. Cl.[2] B21F *1/02*
U.S. Cl. 140—147 **10 Claims**



1. Apparatus for untwisting the two wires of a twisted pair of wires and locating the untwisted wires in side-by-side co-planar relationship comprising:

a templet having a wire supporting surface extending thereacross in one direction,

a recess means in said wire supporting surface, said recess means having one portion which comprises a single recess which is dimensioned to receive said twisted pair of wires and another portion comprising a pair of side-by-side recesses each of which is dimensioned to receive one wire of said twisted pair, said side-by-side recesses extending divergently from said single recess,

a wire pressing member which is movable across said surface in said one direction,

a wire controller disposed adjacent to said wire pressing member, said controller being in advance of said pressing member relative to the direction of movement of said pressing member across said surface, said controller providing wire deflecting surface portions which extend transversely of said wire supporting surface,

actuating means for moving said pressing member and said controller across said wire supporting surface in said one direction, said actuating means having means for maintaining a first spacing between said controller and said pressing member while said pressing member is moving over said one portion of said recess means and for maintaining a second spacing between said pressing member and said controller when said pressing member is moving over said other portion of said recess means, said first spacing being greater than the transverse dimension of said twisted pair of wires, said second spacing being substantially equal to the diameter of one of said wires whereby,

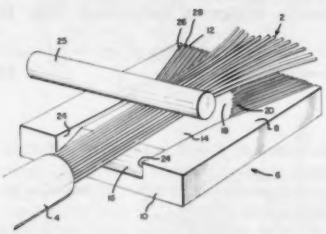
upon placement of said twisted pair of wires on said surface with an intermediate portion of said twisted pair in alignment with said one portion of said recess means and with said twisted pair extending over said wire controller, and upon movement of said wire pressing member and said controller, first portions of said twisted pair of wires will be pressed into said one portion of said recess means in said templet and second portions of said twisted pair will be untwisted and the wires will be pressed into said pair of coextensive recesses, said controller serving to deflect portions of said twisted pair of wires away from said surface and approximately align said wires with said recess means, and said controller serving to confine said wires in side-by-side relationship with each wire in contact with said pressing member and in contact with said controller during movement of said pressing member over said other portion of said recess means thereby to ensure untwisting of said twisted pair and placement of said wires in said side-by-side recesses.

4,132,252

METHOD AND APPARATUS FOR DEPLOYING WIRES

Walter C. Shatto, Jr., Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 21, 1977, Ser. No. 853,992
Int. Cl.[2] B21F *1/02*
U.S. Cl. 140—147 **9 Claims**



1. Templet and roller means for deploying a plurality of wires and locating said wires in side-by-side spaced-apart relationship, said templet and roller means comprising:

a templet block having a working surface, said roller being movable over said working surface from one end of said block to the other end thereof,

a recessed staging surface within said working surface, said staging surface being parallel to said working surface and being recessed beneath said working surface by a distance which is substantially equal to the diameter of one of said wires, said staging surface having a width which is substantially equal to the combined diameters of all of said wires whereby said wires can be staged in side-by-side co-planar relationship on said staging surface with adjacent wires against each other and with the axes of said wires extending towards said other end of said block,

a deploying surface which is co-planar with said staging surface, said deploying surface extending towards said other end of said block and being of decreasing width in the direction extending towards said other end,

a plurality of wire deploying grooves, each of said grooves having an origin at said deploying surface and extending from said deploying surface through said working surface and towards said other end of said block, each of said grooves being dimensioned to receive one of said wires,

the one of said grooves which receives an outside wire in a group of wires on said staging surface having its origin located at a maximum distance from said other end, and successive grooves having their origins located at progressively decreasing distances from said other end whereby,

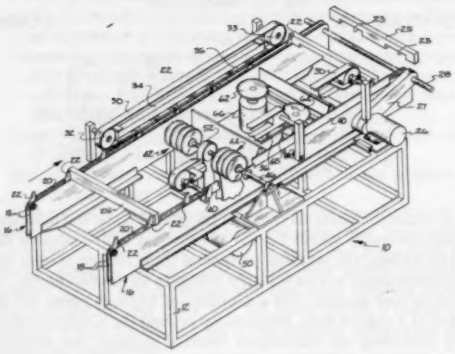
upon positioning said wires in side-by-side parallel relationship on said staging surface with said wires extending towards said other end of said templet block, and upon movement of said roller over said working surface towards said other end of said block, said wires will be successively diverted into said grooves from said deploying surface and portions of said wires at said other end of said block will then be located in side-by-side spaced-apart relationship.

4,132,253

MACHINE FOR NOTCHING PALLET STRINGERS

Thomas O. Mills, 219 N. Maple, Douglas, Kans. 67039

Filed Feb. 25, 1977, Ser. No. 771,980
Int. Cl.[2] B27C *5/00*
U.S. Cl. 144—133 R **5 Claims**



1. A machine for cutting notches in pallet stringers comprising:

a base frame;

a conveyor means on the frame having drive members, which supports and drives the stringers in a lateral direction relative to their longitudinal dimension through the machine;

a first cutting means including at least four vertically positioned and horizontally spaced saw blades rotatably mounted on the frame to make at least four parallel vertical cuts in each of the stringers as the conveyor means drives them through the machine;

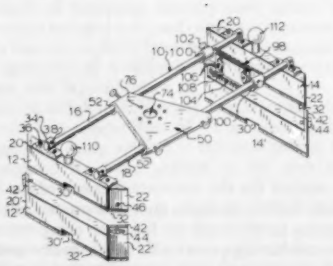
a second stage cutting means including a horizontally positioned saw blade with a downwardly extending drive shaft, the blade having a diameter substantially the same as the distance between the two outermost cuts made by the first cutting means; the second cutting means being positioned on the frame so that the blade first cuts away that portion of the stringer between the two innermost cuts thereby allowing said drive shaft to pass therethrough while cutting away the remaining portions of the stringer between the two outermost cuts.

4,132,254

PORTABLE PLANING MACHINE

Robert E. Shockovsky, 4016 Landside Dr., Louisville, Ky. 40220

Filed Oct. 21, 1977, Ser. No. 844,216
Int. Cl.[2] B27C *1/14*
U.S. Cl. 144—134 D **15 Claims**



1. A portable planing machine that is adapted to be supported on a work bench on which a work piece is to be fixdly supported, said machine comprising in combination,

a. spaced slidable runner means joined together by parallel ways which are adapted to overlie the work piece,

b. carriage means adjustably mounted on the ways,

c. a router attached to the carriage means and having a vertically arranged cutter bit that is adapted to plane the top surface of the work piece as the planing machine is moved over the work piece,

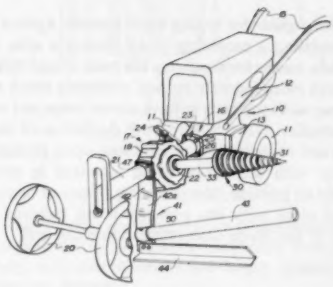
d. and a datum bar carried by the machine and adapted to engage the side of the work piece and guide the movement of the planing machine along the length thereof.

4,132,255

TRACTOR MOUNTED LOG SPLITTING APPARATUS

Russell H. Thackery, 2376 Brentwood Rd., Columbus, Ohio 43209

Filed May 12, 1977, Ser. No. 796,059
Int. Cl.[2] A47J *49/02*
U.S. Cl. 144—193 R **21 Claims**



1. A tractor mounted log splitting apparatus comprising in combination

a tractor including a frame having a longitudinal axis, and engine mounted on said frame, a pair of driven wheels mounted on said frame by a transverse axle and selectively connectable in driving engagement with said engine and

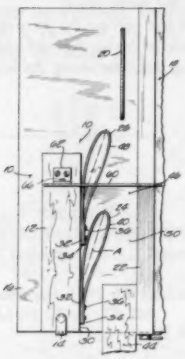
power drive means carried on said frame in forwardly extending relationship thereto, said drive means having coupling means drivingly connectable with said engine and carried in remotely disposed relationship to said frame,

a log splitting tool having a splitter head provided with a conically-shaped, spiral-auger surface and a mounting and drive shaft extending axially from the splitter head, said mounting and drive shaft adapted for mounting engagement with the coupling means to support said splitter head with a terminal apex thereof directed in laterally outward relationship to said power drive means and extending transversely to the frame's longitudinal axis,

an elongated stop-bar mountable on said power drive means in fixed relationship thereto, said stop bar extending transversely to the tractor frame's longitudinal axis in spaced relationship to the surface of the splitter head forming a throat for passage of logs therethrough, and

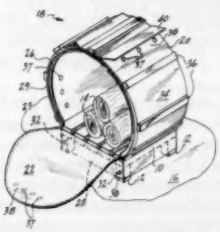
a ground-engaging stabilizing support carried by said power drive means and adapted to resist rotation of the tractor frame about both the transverse axle of said driven wheels and the frame's longitudinal axis, said stabilizing support including a ground engaging support foot disposed in laterally projecting relationship to the tractor frame's longitudinal axis at the same side as said log splitting tool and said stop bar.

4,132,256
GUIDE FOR CUTTING APPARATUS
John C. Jones, 719 Summit Ave., Waukesha, Wis. 53186
Filed Jun. 22, 1977, Ser. No. 808,835
Int. Cl.[2] B27C 5/04
U.S. Cl. 144—253 F 4 Claims



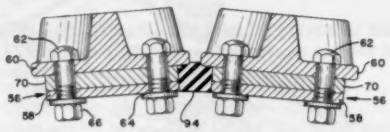
1. A cutting guide for urging work material against a cutting fence comprising a mounting block having a side, a pair of spring bands, means for mounting the ends of said spring bands together and independently on said mounting block at a point remote from said loop ends to form closed loops and to provide a loop deflection axis to afford both deflection of the axes of said loops and compression of said loops upon pressure from a work piece with said loops being mounted in overlapping relationship to provide lateral biasing forces at spaced points on a work piece with less pressure being required to cause deflection of said loops than compression thereof.

4,132,257
PROTECTIVE DEVICE FOR LOGS AND LOG RACKS
Michael Filosa, Granite Brook Dr., Granite Springs, N.Y. 10527
Filed Jul. 18, 1977, Ser. No. 816,438
Int. Cl.[2] B65D 65/02
U.S. Cl. 150—52 R 7 Claims



1. A flexible, self-supporting, shape-retaining protective device for use in conjunction with a log rack for storing logs, comprising a hollow walled partial sleeve capped at one distal end and open at the opposite distal end, movable capping means disposed at said opposite end, means for opening and closing said movable capping means, said capping means movable between and open and closed position about said open end, an apron depending from a lower portion of said capping means, a longitudinal opening running substantially entirely along the longitudinal axis of said sleeve between said two ends and engaging the periphery of said log rack, a plurality of rigid ribs diposed in spaced apart relation substantially about the entire longitudinal axis of said sleeve.

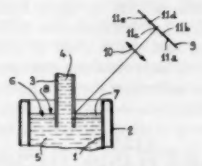
4,132,258
ARMORED TIRE
Aleksandar Vidakovic, Libertyville, and Karl Salna, Mundelein, both of Ill., assignors to International Harvester Company, Chicago, Ill.
Continuation of Ser. No. 619,758, Oct. 6, 1975, abandoned. This application Nov. 14, 1977, Ser. No. 850,866
Int. Cl.[2] B60C 27/20
U.S. Cl. 152—185 2 Claims

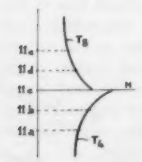


1. In combination, an armored peripheral track and a tire and wheel assembly where the tire is provided with a smooth flat tread surface, the armored peripheral track having at least one circumferential ply to which a plurality of anchor plates, including end spacers, and a plurality of traction plates are affixed in a spaced apart relationship around the circumferential ply providing an interrupted internal surface, the armored peripheral track for use on the tire which is inflated into the track, the combination further comprising:

an elastomer plug placed between adjacent anchor plate and traction plate assemblies at the outboard ends thereof, the elastomer plug penetrating to the outboard edge of the circumferential ply whereby the spaces between said anchor plate assemblies are sealed at the outboard ends thereof.

4,132,259
AUTOMATIC CONTROL OF THE LEVEL OF A MOLTEN METAL BATH
Pierre Poncet, 12 bis, rue Trarieux, Lyon, France
Filed Jul. 29, 1977, Ser. No. 820,484
Claims priority, application France, Aug. 12, 1976, 76 25267
Int. Cl.[2] B22D 11/16
U.S. Cl. 164—4 9 Claims





1. In a method for the automatic control of the level of a molten metal bath to maintain same at a proper height in continuous casting molds which are fed by an elongated refractory pouring nozzle having an axis which extends downwardly into the bath below a supernatant protective slag layer extending radially from the nozzle, an optical image of the upper portion of the said mold including the nozzle and the slag layer being formed at a location spaced from the mold and being directed onto temperature measuring means to obtain analogs varying

in accordance with the position of the said level within the mold, the improvement comprising the steps of:

measuring the temperatures at points disposed sequentially in spaced relationship in a line substantially lying along the axis of the image of said nozzle and along a radius of the slag layer image, in such manner that some of the temperatures are analog signals representing radiation at successive points along the periphery of said nozzle and others of the temperatures are analog signals representing radiation at successive points along the surface of said slag layer;

comparing successive analog signals to determine temperature gradients wherein the direction of the gradients reverses at a zone where said line crosses the intersection of said images of the nozzle and the slag layer;

selecting as the analog of the position of said level the zone of said line where said gradient reverses;

and generating a controlling signal based on the position of said zone along said line.

6. An apparatus to generate a controlling signal adapted to achieve automatic control of a molten metal bath level within a continuous casting mold having an upper end into which the molten metal is fed through a refractory axially-elongated pouring nozzle which extends into said mold below a protective supernatant slag layer, and the mold having a lower end through which a solidified bar of the metal is withdrawn, said apparatus comprising:

an optical instrument disposed above said mold and offset laterally with respect thereto with its axis at an angle to the vertical, the instrument being operative to form an optical image of the upper end of said mold including said pouring nozzle and said slag layer;

a plurality of photo-electric cells disposed in a line lying substantially along the axis of the image of said nozzle, some of said cells intercepting the image of said nozzle and others of the cells intercepting the image of said layer;

means connected to the cells for receiving analog signals from said cells proportional to the intensity of radiation to each cell, said means being operative for determining from said signals the direction of the gradient of said analog signals along said line;

means connected to said receiving means to detect a zone along said line where said gradient reverses;

and means connected to said detect means to generate said controlling signal in response to the position of said zone along said line.

4,132,260

METHOD AND APPARATUS FOR HARDENING OF FOUNDRY CORES

Werner Luber, Bahnhofstrasse 23-32, Bazenheid, Switzerland

Continuation of Ser. No. 723,070, Sep. 14, 1976, abandoned. This application Oct. 11, 1977, Ser. No. 841,044

Claims priority, application Switzerland, Oct. 2, 1975, 12818/75

Int. Cl.² B22C *9/12*

U.S. Cl. 164—16 **6 Claims**

1. Method of hardening foundry core means made of a mixture which includes sand and curable compounds in which, to harden the core means, the core means is exposed in a core-forming apparatus to a mixture of a gaseous catalyst and a carrier gas, and to compressed air

wherein, in order to accurately predetermine the volume, pressure and temperature of the gaseous catalyst-carrier gas mixture being applied to the core means, and of the compressed air being applied to the core means, the method comprises the

providing a source (**4**, **5**, **6**) of gaseous catalyst-carrier gas mixture;

providing a source (**12**, **13**) of compressed air;

providing a first temporary storage vessel (**8**) for gaseous catalyst-carrier gas mixture;

supplying said catalyst-carrier gas mixture from said mixture source to said first temporary storage vessel (**8**);

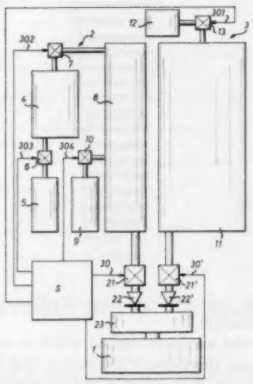
segregating and temporarily storing a predetermined quantity, which corresponds to the desired amount to cure the core means in the core forming apparatus, of the mixture of gaseous catalyst and carrier gas in the first temporary storage vessel (**8**);

providing a second temporary storage vessel (**11**) of substantially greater volume capacity than said first temporary storage vessel (**8**);

supplying compressed air from said compressed air source to said second temporary storage vessel;

segregating and temporarily storing a predetermined quantity, which corresponds to the desired amount to flush the core means in the core forming apparatus, of compressed air in the second temporary storage vessel (**11**);

controlling pressure, and the temperature of the compressed air in said second temporary storage vessel to be higher



than the pressure and temperature of the gaseous catalyst-carrier gas mixture in said first temporary storage vessel to thereby segregate a controlled larger quantity of compressed air therein;

suddenly and abruptly and rapidly injecting such stored mixture of gaseous catalyst-carrier gas from said first temporary storage vessel into the core means in the core forming apparatus by admitting the segregated, desired quantity of said stored mixture into the core forming apparatus; and then suddenly and abruptly and rapidly injecting said compressed air from said second temporary storage vessel at said elevated temperature and with said higher pressure into the core means in the core forming apparatus by admitting the segregated desired larger quantity of said stored compressed air into the core forming apparatus.

4,132,261

SUPPORT, DRIVE AND GUIDE ROLLER STAND FOR METAL STRAND CASTING PLANTS, PARTICULARLY FOR STEEL SLAB CURVED STRAND CASTING PLANT

Gerhard Komma, Dinslaken; Dieter Kothe, Moers, and Werner Rahmfeld, Mulheim, all of Germany, assignors to DEMAG Aktiengesellschaft, Duisburg, Germany

Filed Aug. 11, 1977, Ser. No. 823,760

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1976, 2636667

Int. Cl.² B22D *11/12*

U.S. Cl. 164—448 **15 Claims**

1. In roller stand apparatus for a metal strand casting plant, particularly a steel slab curved strand casting plant, and having

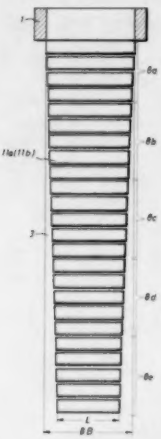
(a) a plurality of roller segments;

(b) each said segment including a pair of opposed segment frames;

(c) each pair of opposed segment frames carrying a plurality of rollers and counter-rollers;

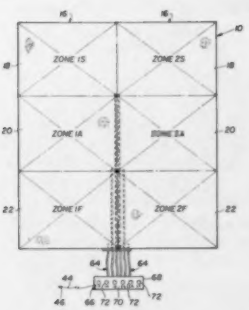
(d) said opposed rollers and counter-rollers in said plurality

of roller segments defining a cast strand path sequentially of support, drive and guide rollers;
the improvement characterized by
(e) the length of at least some of said support rollers in said support roller area of said path being determined in accordance with the equation $L = BB - (2.5 - 5 \cdot SD)$ wherein



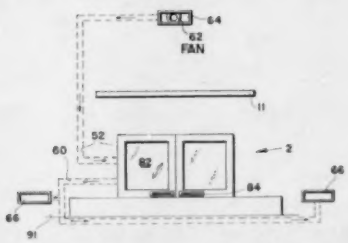
(1) L is the length of said support rollers in paragraph (e) in millimeters,
(2) BB is the maximum strand width in millimeters,
(3) SD is the thickness of the strand shell in millimeters at the location of the roller or rollers whose length is being determined; and
(f) said strand thickness (SD) is based upon the maximum casting speed of said roller stand.

4,132,262
HEATING AND COOLING BLANKET
Joan Wibell, 342 E. 67th St., New York, N.Y. 10021
Filed Jan. 17, 1977, Ser. No. 759,797
Int. Cl.[2] F28F *7/00*; F25B *29/00*
U.S. Cl. 165—26 **18 Claims**



1. A cooling and heating blanket comprising:
a. a blanket enclosure,
b. heating means including a plurality of flexible elements positioned within said enclosure for being electrically energized for supplying heat to said enclosure, such that said enclosure may be retained above room temperature,
c. cooling means including a plurality of flexible fluid carrying conduits positioned within said enclosure through which a heat transfer fluid can flow, such that said enclosure may be retained below room temperature,
d. control means including an electric motor and a pump driven thereby located remotely relative to said enclosure,
e. flexible conduit means connecting said enclosure and said cooling means,
f. regulating means operatively associated with said heating means and said cooling means, said regulating means adapted to energize said control means or said heating means in response to increases and decreases of the temperature associated with said enclosure, such that the temperature of the blanket may be retained above or below the room temperature in which the blanket is located,
g. said enclosure is divided into at least two major sections and each one of said sections may be independently regulated from said heating means or said cooling means,
h. said major sections are each divided into respective zones,
i. each one of said zones being independently controllable by said regulating means such that different respective portions of the human body may be concurrently maintained at temperatures ranging from below to above room temperature by said heating means and said cooling means, and
j. said zones include:
(1) an upper zone for maintaining the upper torso of the body at a preselected temperature,
(2) an intermediate zone for maintaining the lower torso at a preselected temperature, and
(3) a lower zone for maintaining the legs at a preselected temperature.

4,132,263
COMBINED HOUSEHOLD HEATING AND COOLING UNIT FOR AIR AND WATER
M. Wayne Stinnett, 4065 Sunrise Farms Rd., Middleburg, Fla. 32068
Filed May 26, 1977, Ser. No. 800,713
Int. Cl.[2] F25B *29/00*
U.S. Cl. 165—48 R **8 Claims**



1. A fireplace heating and cooling system, comprising:
a firebox having a mouth for the introduction of fuel and a throat for the exhaustion of combustion gases;
a water reservoir mounted on top of said firebox having an external wall through which is mounted a water inlet and a water outlet, and having a central passage formed by an interior wall of said reservoir, communicating with said throat, with first heat exchanging elements mounted on said interior wall within said central passage for absorbing heat from said combustion gases and second heat exchanging elements mounted on said interior wall within said reservoir for transferring said absorbed heat to the water stored in said reservoir;
a valve means connected to said water inlet and water outlet, having a first position connecting said water inlet to a pressurized water supply and said water outlet to a hot water outlet;
said water reservoir having third heat exchanging elements

mounted on the outside surface of the external wall of said reservoir;

an air plenum formed around said external wall of said reservoir having an air inlet and an air outlet mounted therein and connected to a space whose temperature is to be maintained, for conducting air across said third heat exchanging elements, to transfer heat between said water and said air;

a fourth heat exchanging element connected to a heat sink, through which water is circulated by means of a pump, having a water inlet and a water outlet;

said valve means having a second position connecting said water inlet of said water reservoir to said water outlet of said fourth heat exchanging element and connecting said water outlet of said water reservoir to said water inlet of said fourth heat exchanging element;

said air being warmed in said plenum for heating said space and said pressurized water being warmed in said reservoir with said valve means in said first position, for supplying hot water, after combustion has occurred in said firebox;

said air being cooled in said plenum for cooling said space, with said valve means in said second position, when no combustion has occurred in said firebox.

4,132,264

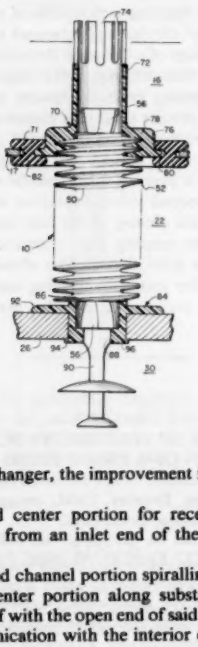
PLASTIC HEAT EXCHANGE TUBE

Donn B. Furlong, San Rafael, Calif., assignor to Ecodyne Corporation, Lincolnshire, Ill.

Continuation-in-part of Ser. No. 534,592, Dec. 20, 1974, abandoned. This application Jan. 6, 1977, Ser. No. 757,194

Int. Cl.[2] F28F *1/06*

U.S. Cl. 165—179 **3 Claims**



1. In a heat exchanger, the improvement in a heat exchange tube, comprising:

a. an elongated center portion for receiving liquid flow therethrough from an inlet end of the tube to an outlet end,

b. an open-ended channel portion spiralling in one direction about said center portion along substantially the entire length thereof with the open end of said channel portion in fluid communication with the interior of said center portion,

c. said center and channel portions being integrally formed from plastic so as to be seamlessly joined to each other along said length,

d. the height of said channel portion being a least as great as the pitch of the spiral and no greater than two times the pitch, and

e. a web portion extending through said center portion so as to impart longitudinal stability to the tube and to turbulently rotate liquid flowing through the tube outwardly into said channel portion,

f. said web portion having at least two substantially radially extending legs,

g. said radially extending legs spiraling about the axis of said center portion along substantially the entire length of said center portion.

4,132,265

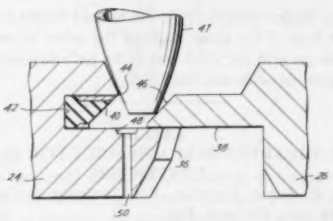
PIPE SHEARING RAM ASSEMBLY FOR BLOWOUT PREVENTER

Leonard E. Williams, Jr., Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.

Filed Apr. 6, 1978, Ser. No. 893,976

Int. Cl.[2] E21B *29/00*

U.S. Cl. 166—55 **7 Claims**



5. A shear ram assembly for a ram type blowout preventer, comprising

a pair of rams,

each ram having a shear blade attached thereto in position for the shearing edge of the blade on one ram to pass just below the shearing edge of the blade on the other ram to shear any pipe positioned in the pipe opening when the rams are moved together to close off the opening,

seal means on one of said rams positioned to be engaged and compressed by the shear blade of the other ram when the rams are extended to form a seal, and

a shoulder on the ram having the lower shear blade,

a recess above said upper shear blade,

said seal means being positioned above the upper surface of said lower shear blade, and

pipe forcing means including a wedge shape on the leading edge of the upper shear blade which coacts with said shoulder to raise the sheared pipe above the lower shear blade out of the path between said lower shear blade and said seal means.

4,132,266

PIPE SHEARING RAM ASSEMBLY FOR BLOWOUT PREVENTER

Ross D. Randall, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.

Filed Apr. 6, 1978, Ser. No. 893,977

Int. Cl.[2] E21B *29/00*

U.S. Cl. 166—55 **9 Claims**

1. A blowout preventer, comprising

a body having a pipe opening therethrough,

ram guideways extending laterally from opposite sides of the pipe opening,

a ram assembly including a pair of rams each positioned in one of said guideways and means for moving the rams together to close off the pipe openings and for moving the rams apart to open the pipe opening,

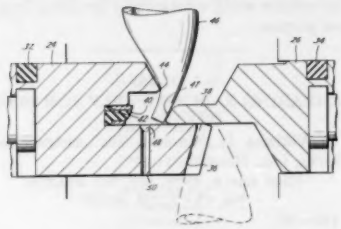
seal means for said ram assembly,

each of said rams having a pipe shearing blade extending inward, and

one of said rams having a shoulder and a face seal being a

portion of said seal means and adapted to be engaged by the face of the shear blade of the other of said rams,

said shoulder being spaced inward from said face seal and being a sufficient distance from the shearing plane of said



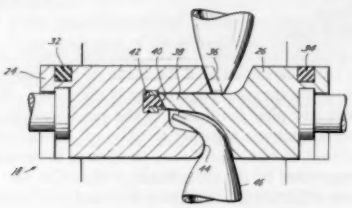
two blades whereby pipe cut by said blades is engaged by the face of the shear blade of the other of said rams and bent on said shoulder out of its path toward sealing engagement with said face seal.

4,132,267

PIPE SHEARING RAM ASSEMBLY FOR BLOWOUT PREVENTER

Marvin R. Jones, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.

Filed Apr. 6, 1978, Ser. No. 893,978
Int. Cl.[2] E21B *29/00*
U.S. Cl. 166—55 **2 Claims**



1. A blowout preventer comprising,

a body having a pipe opening therethrough,

ram guideways extending laterally from opposite sides of the pipe opening,

a ram assembly comprising first and second rams, each located in one of the ram guideways, and means for moving the rams together to close off the pipe opening and for moving the rams apart to open the pipe opening,

each ram having a shear blade attached thereto in position for the cutting edge of the blade on said second ram to pass just below the cutting edge of the blade on the said first ram to shear any pipe positioned in the pipe opening when the rams are moved together to close off the opening,

seal means around said rams including a seal positioned in said first shear ram at a location to be engaged by the leading face of the lower shear blade of said second shear ram, and

inwardly extending transverse shoulder on said first ram spaced below and projecting inwardly beyond said seal whereby the end of a sheared pipe remaining in said pipe opening is engaged by and bent on said shoulder out of the path of said lower shear blade so that said lower shear blade may seal against said seal,

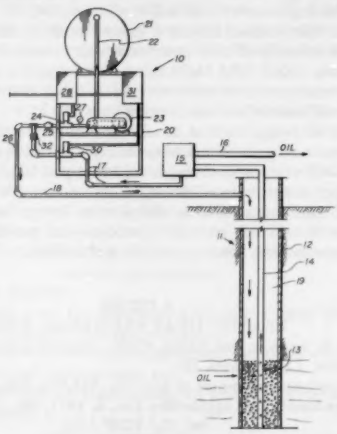
said seal being positioned below said upper shear blade so that debris resulting from shearing pipe falls into said pipe opening and does not interfere with the sealing engagement between said seal and said lower shear blade.

4,132,268

METHOD FOR INSURING OIL WELL TREATMENT ON A REGULAR BASIS AS SCHEDULED

Robert J. Harrison, deceased, late of Hominy, Okla. (by Carmen H. Shannon, executrix), assignor to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 733,659, Oct. 18, 1976, abandoned. This application Dec. 14, 1977, Ser. No. 860,346
Int. Cl.[2] E21B *43/00, 43/24*
U.S. Cl. 166—244 C **13 Claims**



13. A method for insuring well treatment on a regular basis as scheduled and for eliminating personnel time required for manually flushing slugs of a chemical throughout a well for an extended period of time comprising the steps of,

(a) repeatedly ejecting precisely spaced apart consecutive predetermined precise slugs of a chemical to a well, and

(b) repeatedly ejecting a predetermined precise slug of a flush liquid directly behind and contiguous with each chemical slug for pushing that chemical slug into the well by opening a second valve responsive to a second timer immediately upon closing of the first valve responsive to a first timer for insuring well chemical treatment on a regular basis as scheduled and for eliminating personnel time required for manually flushing each chemical slug throughout the well for an extended period of time.

4,132,269

GENERATION OF ELECTRICITY DURING THE INJECTION OF A DENSE FLUID INTO A SUBTERRANEAN FORMATION

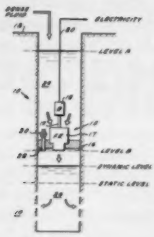
Anthony J. Chasteen, Brawley, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed Jan. 16, 1978, Ser. No. 869,603
Int. Cl.[2] E21B *43/20;* F03G *7/04*
U.S. Cl. 166—268 **15 Claims**

1. A method for the generation of electricity during the injection of a dense fluid through an injection well and into a subterranean formation having a connate fluid pressure less than the available downhole pressure of the dense fluid in the injection well, which method comprises:

placing a fluid engine/generator at a preselected position in said injection well, thereby defining upper and lower zones in said well above and below said fluid engine/generator, respectively, said fluid engine/generator including means for converting the motive power of a flowing stream of said dense fluid to electricity;

establishing a column of said dense fluid in said upper zone of said well;



flowing said dense fluid from said upper zone through said fluid engine/generator and into said subterranean formation, thereby generating electricity; and

transmitting said electricity to the surface.

4,132,270

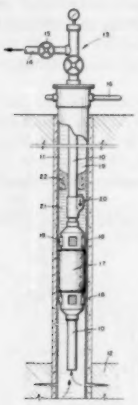
METHOD FOR PROTECTION OF WELL EQUIPMENT FROM PARTICLES OF DEBRIS

Warren E. Holland, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Continuation-in-part of Ser. No. 723,399, Sep. 15, 1976, abandoned. This application May 26, 1977, Ser. No. 800,832

Int. Cl.[2] E21B *43/08*

U.S. Cl. 166—314 **18 Claims**



11. A method for protecting stationary equipment located completely within the casing of a well from particles of debris which comprises forming a column of a protective liquid in contact with and extending above said equipment in said casing, said protective liquid having a density of at least about 3.0 g/ml.

4,132,271

FRAGMENT PREVENTION SCREEN FOR EXPLODABLE FIRE SUPPRESSANT PANELS

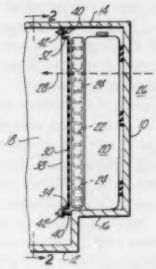
Joseph J. Mikaila, Troy, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 11, 1977, Ser. No. 814,354

Int. Cl.[2] A62C *35/12*

U.S. Cl. 169—62 **1 Claim**

1. In a military vehicle having an internal fuel tank disposed in close adjacency to one of the vehicle external walls, a hollow panel containing pressurized fire suppressant, said panel being located immediately inboard from the fuel tank so that one wall of the panel lies flatwise against a major wall of the tank, said panel and fuel tank having approximately the same profile normal to said one external wall whereby the panel intercepts enemy projectiles fired into the fuel tank from external areas alongside the vehicle: the improvement comprising an anti-fragmentation foraminous screen coextensive with the fire suppressant panel; frame means defining a rigidifying border that anchors the screen at selected points around its peripheral edge; means **(40,42)** trained between the vehicle and frame for drawing the frame-screen unit tightly against the inboard wall of the fire suppressant panel, whereby the screen tends to



minimize the tendency of the panel material to fragment into separate particles as the suppressant enlarges a hole initially formed by the projectile; the screen being an expanded metal screen having a capability of stretching in response to the forcible movement of panel wall elements thereagainst; the screen being formed so that the screen openings are about one inch in diameter; the screen being the sole layer of material on the inboard wall of the fire suppressant panel, whereby the hole enlargement action of the suppressant is substantially unaffected by the screen structure.

4,132,272

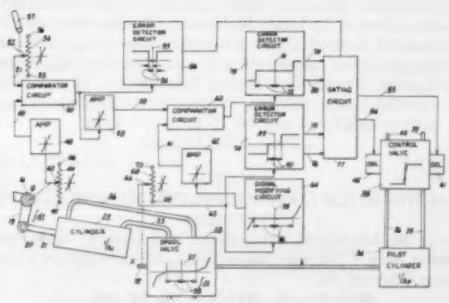
TRACTOR HITCH POSITION CONTROL SYSTEM

Gale A. Holloway, Joliet; Wayne W. Lark, Westmont; Phillip M. McLaughlin, Downers Grove, and Robert M. Mortonson, Park Ridge, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Jun. 30, 1977, Ser. No. 811,517

Int. Cl.[2] A01B *63/10*

U.S. Cl. 172—2 **5 Claims**



1. A control system for a hydraulically operated tractor hitch assembly which includes a main cylinder for controlling hitch raising and lowering movements, a main valve including a control element, said main valve having a dead zone in a neutral position requiring movement of said control element thereof away from a neutral position to effect flow in either direction, for controlling fluid flow to said main cylinder, a pilot cylinder for operating said main valve control element, and electrically operated pilot valve means for controlling

fluid flow to said pilot cylinder, said control system comprising:

means for supplying a command signal having a magnitude corresponding to a target condition of said hitch assembly;

first feedback means for developing a first feedback signal corresponding to an actual operational condition of said hitch assembly;

second feedback means for developing a second feedback signal in response to movements of said main valve control element in either direction beyond said dead zone;

comparative circuit means responsive to said command signal and said first and second signals to develop an output signal such that in response to a difference between said command and first feedback signals flow to said main cylinder is cut off through actuation of said main control valve after said hitch assembly is moved to within a narrow target condition range, selected to optimize accuracy and minimize oscillation, corresponding to said new target condition and before said hitch assembly is moved beyond said narrow target condition range; and

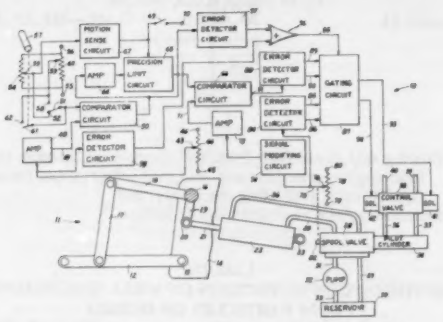
detector means being operative in response to balancing of said command and first feedback signals for controlling said pilot valve means from said second feedback signal to move said main valve control element to said neutral position thereof and said detector means including a first detector circuit responsive to said command and first and second feedback signals, a second detector circuit responsive to said second feedback signal, gating means for selective control of said electrically operated pilot valve means from said first detector circuit or said second detector circuit, and a third detector circuit responsive to a predetermined unbalance of said command and first feedback signals to control said gating means to operate said electrically operated pilot valve means from said first detector circuit and responsive to balancing of said command and first feedback signals to control said gating means to operate said pilot valve means from said second detector circuit, said detector means responsive to said comparator circuit circuit means output signal and arranged to control said electrically operated pilot valve means for controlling positioning of said main valve control element and movement of said hitch assembly to produce said target condition, said main valve control element being initially moved in a direction corresponding to a direction of change in said command signal which signals a new target condition, and said second feedback signal being applied in a direction to cause movement of said main valve control element in a reverse direction, said detector means in association with said electrically operated pilot valve means being operative to provide threshold values of operation such that a predetermined difference in each direction between the amplitude of said output signal and a reference potential at a fixed level relative to ground is required for operation of said pilot valve in a corresponding direction to initiate flow to said pilot cylinder.

4,132,273
TRACTOR HITCH CONTROL SYSTEM HAVING SAFETY FEATURES

Robert M. Mortonson, Park Ridge, and Gale A. Holloway, Joliet, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Jun. 30, 1977, Ser. No. 811,500
Int. Cl.[2] A01B *63/10*
U.S. Cl. 172—2 **9 Claims**

6. The control system for a hydraulically operated tractor hitch assembly which includes a main cylinder for controlling hitch raising and lowering movements, a main control valve including a control element for controlling fluid flow to said main cylinder, a pilot cylinder for operating said main valve control element, and electrically operated pilot valve means for controlling fluid flow to said pilot cylinder, said control system comprising: means for supplying a first command signal corresponding to a target condition of said hitch assembly, a first feedback means for developing a first feedback signal corresponding to an actual condition of said hitch assembly, second feedback means for developing a second feedback signal corresponding to the position of said main valve control element, comparator circuit means responsive to said command signal and said first and second feedback signals to develop an output signal, detector means responsive to said com-

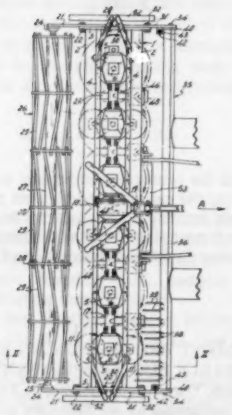


parator circuit means output signal and arranged to control said electrically operated pilot valve means for controlling positioning of said main valve control element and movement of said hitch assembly to a target condition, means for supplying a second command signal at a fixed magnitude corresponding to a fully raised position of said hitch assembly and switch means for selectively applying said second command signal to said comparator circuit means.

4,132,274
SOIL CULTIVATING IMPLEMENTS

Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Filed Sep. 13, 1976, Ser. No. 722,509
Claims priority, application Netherlands, Sep. 12, 1975, 7510740
Int. Cl.[2] A01B *33/06, 35/06*
U.S. Cl. 172—59 **11 Claims**



1. A soil cultivating implement comprising a frame and a plurality of rotatable soil cultivating members arranged in a transverse row and said members journalled along the length of an elongated portion of said frame, said frame portion extending transverse to the direction of travel and said cultivating members being mounted on corresponding upwardly extending shafts supported on said frame portion, driving means

connected to rotate said members about axes defined by said shafts, neighboring soil cultivating members being rotated in relative opposite directions by said driving means, each member comprising a substantially horizontal support with tines mounted adjacent the lower end of a respective shaft and tines depending from said support, a transverse row of elongated elements positioned across the working width of the implement and being attached to said frame in advance of said cultivating members, front ends of said elements being attached to support means and said elements extending rearwardly and downwardly, side-by-side to lower soil working rear ends, said rear ends being located adjacent the paths of said cultivating members on circles which are substantially coaxial with the rotary axes of those members and said rear ends being normally positioned at a level substantially above the lower tips of said tines.

4,132,275

ROTARY HARROWS

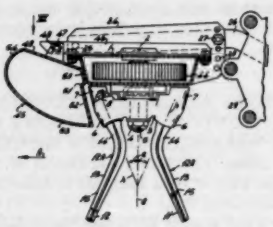
Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Division of Ser. No. 553,693, Feb. 27, 1975, Pat. No. 4,018,288. This application Jan. 17, 1977, Ser. No. 759,672

Claims priority, application Netherlands, Mar. 1, 1974, 7402788

Int. Cl.[2] A01B *33/06*

U.S. Cl. 172—59 **6 Claims**



1. A rotary harrow comprising an elongated frame portion and a plurality of rotatable soil working members supported on said frame portion, said soil working members being rotatable about corresponding upwardly extending axes positioned in a row and driving means connected to rotate said members, said driving means being housed in said frame portion and an elongated ground engaging member being connected to said frame portion, said ground engaging member being located immediately in front of said row of soil working members to protect same from ground debris, said ground engaging member extending across substantially the entire working width of said row, said member being pivoted to said frame portion and being freely pivotable upwardly and downwardly about a substantially horizontal pivotal axis that extends transverse to the direction of travel, said horizontal axis being located in front of the rear of the ground engaging member and immediately above said frame portion, said member being hollow and having a rear surface that comprises an elongated abutment stop, said stop extending substantially parallel to the front side of said frame portion and being located to the rear of said horizontal pivotal axis.

4,132,276

ARRANGEMENT FOR FORMING VERTICAL OR STEEPLY INCLINED SHAFTS

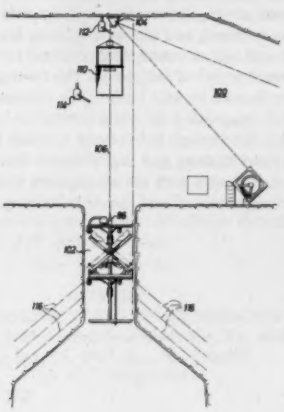
Torbjörn Svensson, Skelleftea, Sweden, assignor to Linden-Alimak AB, Skelleftea, Sweden

Filed Jan. 31, 1977, Ser. No. 763,823

Claims priority, application Sweden, Feb. 12, 1976, 7601571

Int. Cl.[2] E21C *23/00*

U.S. Cl. 173—1 **10 Claims**



10. A method for cutting vertical or steeply inclined shafts for excavation comprising the steps of

excavating a small pilot shaft,

and then enlarging the pilot shaft from the bottom up by drilling outwardly and downwardly through the walls of the pilot shaft to provide a series of holes fanned out in a circle from each of a series of successively higher positions from the bottom of the pilot shaft,

loading said sets of holes with blasting charges,

and successively detonating the charges at successive vertical positions proceeding from the bottom up.

4,132,277

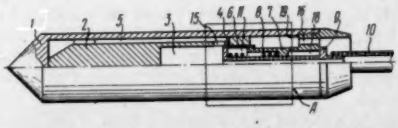
PNEUMATIC REVERSIBLE IMPACT DEVICE FOR DRIVING HOLES IN SOIL

Konstantin K. Tupitsyn, Krasny prospekt, 51/3, kv. 25; Evgeny N. Cherednikov, Vokzalnaya Magistral, 5, kv. 329; Alexandr D. Kostylev, ulitsa Derzhavina, 19, kv. 44; Vladimir D. Plavskikh, ulitsa Gogolya, 233/1, kv. 34; Vladimir V. Klimashko, ulitsa Novogodnyaya, 44, kv. 24; Khaim B. Tkach, ulitsa Gogolya, 17, kv. 49, and Andron T. Karavaev, ulitsa Pervomaiskaya, 118, kv. 19, all of Novosibirsk, U.S.S.R.

Filed Oct. 3, 1977, Ser. No. 838,733

Int. Cl.[2] E21B *11/02*

U.S. Cl. 175—19 **1 Claim**



1. A pneumatic reversible impact device for driving holes in soil by compacting the latter comprising: a hollow cylindrical body pointed in front; a striker accommodated in said body with axial reciprocating motion for striking blows in the direction of the front and rear ends of the body, said striker forming, together with said body, the front working chamber and having a cylindrical space at the rear end; a mechanism for distributing air and reversing the device, located in the rear space of

said striker and forming, together with the latter, the rear working chamber of the device; said air-distributing and reversing mechanism having a bushing which is fixed relative to said body of the device, and an axially-movable stepped bushing, both bushings being arranged coaxially, and being spring-loaded relative to each other in the axial direction and forming a chamber located in the front part of said air-distributing and reversing mechanism; said chamber communicating with a source of compressed air during the forward travel of the device and serving for moving said movable bushing when the device is reversed; said movable bushing has a through hole in the side wall and an external longitudinal recess, so that during the forward travel of said device the through hole places said chamber formed by said bushings in communication with the source of compressed air while during the backward travel of the device the through hole of said movable bushing is covered by said fixed bushing and said chamber formed by said bushings communicates with the atmosphere through said external longitudinal recess of said movable bushing.

4,132,278

HYDROSTATIC TRANSMISSIONS

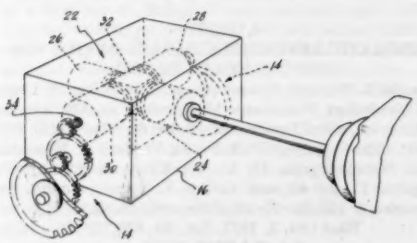
Eugenio Tedeschini, Latina, Italy, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed May 17, 1977, Ser. No. 797,662

Claims priority, application United Kingdom, May 20, 1976, 20824/76

Int. Cl.² B62D *11/06*

U.S. Cl. 180—6.48 **2 Claims**



1. A crawler vehicle having a pair of ground engaging tracks, a housing, drive means supported on said housing and drivingly engaging said tracks to propel the vehicle, a hydrostatic transmission mounted within said housing to transmit drive from an engine to said drive means, said transmission comprising a manifold, a pair of pumps mounted on a first pair of opposite faces of said manifold and a pair of motors, mounted on a second pair of opposite faces of said manifold, said manifold including passage means interconnecting each pump with its respective motor, a pair of supports each having an aperture to encompass at least a portion of said manifold and being split into two parts to allow assembly of said transmission into said housing, one of said parts being attached to the housing and the other part being connectable by fastener means to said one part to support said manifold which in turn supports the transmission in said housing.

4,132,279

AUTOMOTIVE TRACTOR UNIT, MORE PARTICULARLY FOR RIDING AND WORKING ON VERTICAL WALLS, CEILINGS AND SUCHLIKE

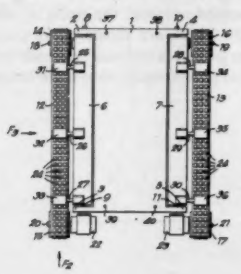
Leendert J. van der Lende, Jan Van Avenne straat 530, and Michel L. Zwaanswijk, Zijdewindestraat 47 A, both of Rotterdam, Netherlands

Filed Jul. 25, 1977, Ser. No. 818,678

Claims priority, application Belgium, Aug. 18, 1976, 55250

Int. Cl.² B62D *55/10*

U.S. Cl. 180—9.5 **1 Claim**



1. An automotive tractor unit for traversing vertical walls and ceilings, including a frame and two separate driving assemblies mounted on distinct sides of said frame, each of said driving assemblies including a support pivotally mounted on an axle parallel to the longitudinal axis of said frame, a set of wheels including at least two wheels mounted on each said support and having axles substantially perpendicular to said longitudinal axis, said driving assemblies each including a motor driving one of said two wheels, a flexible endless belt arranged on said two wheels, said belt carrying a plurality of rows of surface gripping devices, a series of rollers mounted on each said support above an upper stretch of said belt, so as to exert a pressure on said upper stretch and so as to push said upper stretch in the direction of the lower stretch of said belt.

4,132,280

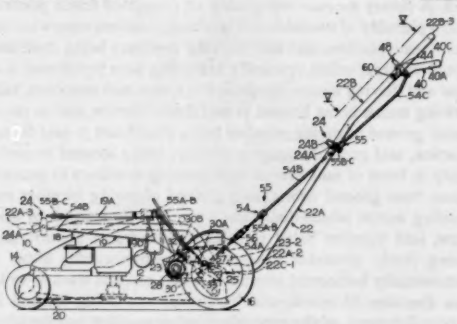
REVERSIBLY MOUNTABLE CLUTCH CONTROL HANDLE MOUNTED ON COLLAPSIBLE HANDLE OF WALK-BEHIND LAWN MOWER

Kenneth R. Jones, Thiensville, and Daniel W. Schaefer, Port Washington, both of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Aug. 5, 1977, Ser. No. 822,279

Int. Cl.² B62D *51/04*

U.S. Cl. 180—19 H **5 Claims**



1. In a walk-behind lawn mower of the self-propelled type and in which said mower comprises a prime mover, drive means constantly driven by said prime mover when said prime mover is in operation, drive wheels adapted to be driven by

said prime mover through said drive means whereby to propel said mower along the ground, said drive means being adapted to be moved into driving engagement with said drive wheels, and in which said mower comprises a mower handle of generally U-shape including a pair of laterally spaced leg members lying in a common plane and a laterally extending cross bar connecting said leg members, the improvement which comprises a clutch control handle for moving said drive means into driving engagement with said drive wheels, said clutch control handle comprising a pair of laterally spaced leg members and a laterally extending cross bar connecting said leg members of said clutch control handle, said oppositely disposed leg members of said clutch control handle each being respectively pivotally connected to a corresponding one of said leg members of said mower handle, a crank member carried by and corresponding to each of said leg members of said clutch control handle contiguous the lower end of the respective leg members of said clutch control handle, each crank member being adapted to be connected by link means to said drive means, said clutch control handle being adapted to be pivotally mounted on said mower handle in a first mounting position in which said clutch control handle when in unclutched condition and the crank members carried thereby lie forwardly of said common plane, and to be pivotally mounted on said mower handle in a second mounting position in which said clutch control handle when in unclutched condition and the crank members carried thereby lie rearwardly of said common plane, said clutch control handle when in said second mounting position being rotated 180° relative to said first mounting position in its relation to said mower handle whereby in said second mounting position a given leg of said clutch control handle is pivotally connected to an opposite leg of said mower handle as compared to the pivotal connection of said given leg when said clutch control handle is in said first mounting position, link means operatively connecting one only of said crank members to said drive means when said clutch control handle is in each of said first and said second mounting positions, pivotal movement of said clutch control handle toward said common plane in either of said mounting positions being effective to move said drive means into driving engagement with said drive wheels, said link means being connected between said clutch control handle and said drive means on the same lateral side of said lawn mower in both said first and said second mounting positions of said clutch control handle, said link means being connected to a different one of said crank members in one of said mounting positions than in the other of said mounting positions, and means normally biasing said drive means out of driving engagement with said drive wheels.

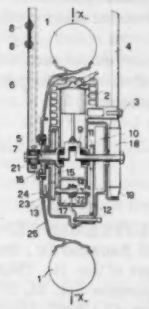
4,132,281

DRIVE WHEEL WITH AN INTERNAL COMBUSTION ENGINE HOUSED IN ITS INTERIOR

Bruno Gaddi, Pisa, Italy, assignor to Piaggio & C. S.p.A., Genoa, Italy

Filed Feb. 23, 1977, Ser. No. 771,319
Claims priority, application Italy, Jun. 25, 1976, 24781 A/76
Int. Cl.² B62D *3/00*
U.S. Cl. 180—33 C **6 Claims**

1. A drive wheel and mounting structure assembly for a motorcycle having a main frame and first and second horizontally spaced apart vertically extending sections, said assembly comprising a wheel having a hub connected to a pedal-driven transmission provided with a free-wheel mechanism, an internal combustion engine arranged inside the wheel, the engine including an engine housing and a drive shaft coaxial with the wheel emerging from one side of the engine housing, said engine housing having said side releasably attached to said first vertically extending section of a vehicle frame, the opposite side of said engine housing being provided with a projecting pivot on which the wheel is rotatably supported, said pivot being releasably attached to said second vertically extending section of the vechicle frame said second section of the vehicle frame being attached to the main frame to allow easy removal



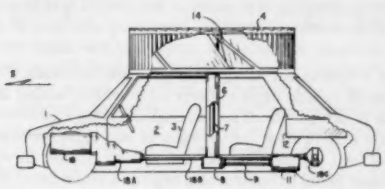
of the wheel when desired, and a transmission drivingly connecting the drive shaft with the wheel.

4,132,282

AUTOMOTIVE ELECTRIC GENERATOR

Keith L. Sparks, 2912 Abigail Dr., Louisville, Ky. 40205

Filed Jan. 17, 1977, Ser. No. 759,998
Int. Cl.² B60K *1/00*
U.S. Cl. 180—65 DD **9 Claims**



1. In an electric motor driven vehicle, including an electric motor adapted to provide motive power to drive said vehicle and electric storage battery means to provide electric current to said motor, an arrangement to provide electric current to the battery including:

(a) fluid flow responsive impeller means rotatably carried in a generally horizontal plane about a central generally vertical axis of rotation for rotation in a generally horizontal plane in response to air flow wherein said impeller means is of generally circular shape having a plurality of spaced vanes to rotate said impeller means in response to flowing air contacting said vanes;

(b) generally vertical shaft means carried by said impeller means for rotation by said impeller means;

(c) cage means stationary with respect to said impeller means located in spaced relation therefrom, to define a chamber to receive said impeller means, wherein said cage means includes a plurality of generally parallel spaced vertically disposed flat air directing cage louvers physically defining the exterior boundary of said cage means, where said cage louvers define air flow conduits therebetween so as to admit a multiplicity of air streams to said impeller means to rotate said impeller means where said louvers are disposed with one side to direct air flow disposed at a selected attitude relative to a tangent line of the periphery of said cage to direct air flowing therethrough to rotate said impeller means, and where a selected number of said cage louvers, lying consecutively along a portion of the periphery of said cage means are individually attitudinally disposed irrespective of ambient wind of vehicular direction, at different angles, which when measured relative to a tangent to said cage means drawn at the locus of an individual cage louver, is less than ninety

degrees, and where the attitudinal disposition of a first portion of said cage louvers defining flow paths therebetween to admit a first portion of an air stream to said impeller means to rotate said impeller means in a selected direction;

(d) electric generator means mechanically connected for rotation by said shaft means to generate electric current for said electric motor.

4,132,283

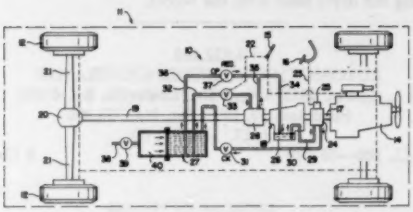
SYSTEM TO SUPPLEMENT ENGINE POWER

Jere L. McCurry, 3915 Kenwood Dr., Stow, Ohio 44224

Continuation-in-part of Ser. No. 710,462, Aug. 8, 1976, abandoned. This application Feb. 21, 1978, Ser. No. 879,147

Int. Cl.[2] B60K *25/02*

U.S. Cl. 180—66 R **3 Claims**



1. In a system for using high pressure hydraulic fluid to supplement vehicle engine power on a vehicle having at least one pair of driven wheels and an engine having a power output shaft and a drive shaft for the axles of said driven wheels and a wheel braking mechanism, said system further having an accelerator pedal to control said engine, a brake pedal to control said wheel braking mechanism, a reservoir for supplying low pressure hydraulic fluid, and an accumulator for storing hydraulic fluid under high pressure, the improvements comprising:

a power transmission unit connected to said engine power output shaft for selectively varying the torque output from said engine and rotating said drive shaft;

a wheel braking mechanism signal circuit operator controlled and positively actuated by depression of said brake pedal;

a fluid pump between said engine and said power transmission unit adjacent said power output shaft;

a control means connected to said wheel braking mechanism signal circuit for engaging said fluid pump with said power output shaft to transmit low pressure fluid from said reservoir to said accumulator when said brake pedal is depressed;

an engine throttle mechanism signal circuit controlled and positively actuated by depression of said accelerator pedal;

a fluid motor between said power transmission unit and said axles of said driven wheels adjacent said drive shaft; said fluid motor having an assembly for selectively engaging said drive shaft so as to apply supplementary power thereto; and

a fluid conduit from said accumulator to said fluid motor assembly with an operating valve therein and connected to said engine throttle mechanism signal circuit to transmit high pressure fluid from said accumulator to said fluid motor assembly when said accelerator pedal is depressed, said fluid motor assembly engaging with said drive shaft when the fluid pressure in said accumulator is above a predetermined value.

4,132,284

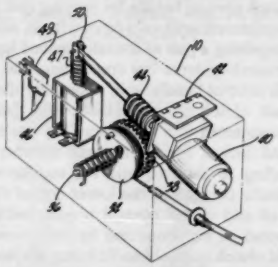
ELECTRONIC CRUISE CONTROL

Jerry J. Tomecek, 29830 Beck Rd., Wixom, Mich. 48096

Filed Feb. 22, 1977, Ser. No. 770,685

Int. Cl.[2] B60K *31/00*

U.S. Cl. 180—105 E **15 Claims**



1. A speed control system for an automotive engine having an accelerator pedal connected to the engine and spring means for biasing the pedal toward a low speed setting, comprising: means connected to the engine for generating an electrical signal having a characteristic which is a function of the speed of the engine; means for storing said electrical signal; operator actuable switch means for momentarily connecting the electrical output of said means for generating an electrical signal having a characteristic which is a function of engine speed to said signal storage means; a comparator operative to receive said electrical signal having a characteristic which is a function of the speed of the engine and the output of said signal storage means and to provide an output signal having a characteristic which is a function of the relative level of its two inputs; and a drive system connected to the pedal and controlled by the output of the comparator.

4,132,285

CONNECTING LINE WITHIN AN EXHAUST SYSTEM OF A MOTOR VEHICLE

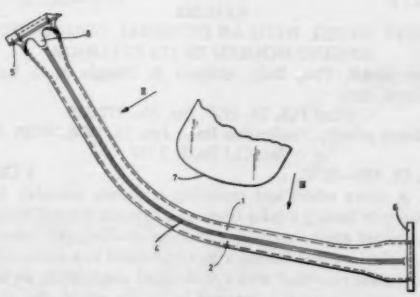
Wilhelm Milde, and Gerhard Hoheisel, both of Wolfsburg, Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Jul. 8, 1976, Ser. No. 704,042

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1975, 2530800

Int. Cl.[2] F01N *1/04, 3/06, 7/18;* F16L *11/00*

U.S. Cl. 181—258 **7 Claims**



1. In a connecting line for the exhaust system of a motor vehicle driven by an internal combustion engine, said connecting line having means at one end thereof for connecting the line to the exhaust manifold of the engine and means at the other end thereof for connecting the line to the succeeding portions of the vehicle exhaust system, the improvement

wherein: said connecting line has a cross section which is at least approximately oval; said cross section is oriented relative to said means at one end so that the larger dimension of said oval lies substantially horizontally when said line is connected to the exhaust manifold of the vehicle; and said connecting line comprises two preshaped elongated sheet-metal half-shells, each having a bowl-shaped cross section, which are arranged in a superposed manner and are firmly connected together.

4,132,286

MUFFLER

Hiroshi Hasui, Tokyo, and Eizo Suyama, Mitaka, both of Japan, assignors to Nihon Radiator Co., Ltd.

Filed Aug. 25, 1977, Ser. No. 827,548

Claims priority, application Japan, Aug. 31, 1976, 51/103124; Aug. 31, 1976, 51/103125

Int. Cl.² F01N *1/00*

U.S. Cl. 181—265 **27 Claims**

1. A muffler comprising:

an upper case provided at the opposite ends with semi-cylindrical inlet and outlet sections respectively and having an outwardly raised central portion and an integral flange-like edge

a lower case joined at a flange-like edge portion to that of said upper case and substantially symmetrical with said upper case with respect to the underside thereof;

an exhaust inlet tube forming member having at least a semi-cylindrical inlet section inserted in a cylindrical inlet formed by the inlet sections of said upper and lower cases joined together and a gutter-like guide section connected to said inlet section and being joined to at least one of said upper case and said lower case, said forming member being provided adjacent to an end thereof with a perforated portion; and

an exhaust outlet tube forming member having at least a semi-cylindrical outlet section fitted in a cylindrical outlet formed by the outlet sections of said upper and lower cases and a gutter-like guide section connected to said outlet section and being joined to at least one of said upper case and said lower case;

the exhaust inlet and outlet tubes formed in this way within the muffler body being in communication with each other through an exhaust gas passage formed between the outer surface of said inlet and outlet tube forming members and the inner surface of said upper and lower cases, the lengths of said inlet and outlet tubes within the muffler body being in spatially overlapping relationship

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4,132,287

SUPPORT ASSEMBLY

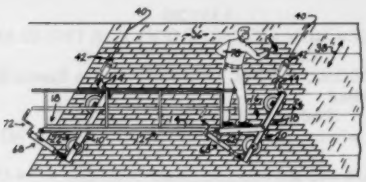
Sammy H. Parolini, P.O. Box 235, Mulberry, Fla. 33860

Filed Feb. 7, 1977, Ser. No. 766,221

Int. Cl.² E04G *3/12, 3/10*

U.S. Cl. 182—45 **10 Claims**

1. A support assembly of the type primarily designed to movably position a scaffold element relative to an inclined surface, said support assembly comprising: a frame, frame support means movably connected to said frame and extending outwardly therefrom into movable engagement with the inclined surface; platform means movably mounted on said frame, platform positioning means movably interconnected to both said platform means and said frame, said platform positioning means disposed to define the angular orientation of said platform means relative to said frame, frame positioning means movably connected to said frame and extendable outwardly therefrom beyond said frame support means and into engagement with the inclined surface, said frame positioning means disposed for support and lateral movement of said frame when in its extended position; wherein said frame positioning means comprises at least one roller element, roller extension means



adjustably interconnecting said one roller element to said frame, said one roller element configured and movably disposed to provide movement of said frame along the inclined surface in a direction substantially transverse to the longitudinal axis of said frame; and wherein said platform positioning means is movably positioned at least in part between said platform means and said frame, said platform means pivotally attached to said frame and said platform positioning means at spaced apart points therefrom, said point of connection between said platform means and said platform positioning means being extendable along the length of said platform positioning means, said platform means dimensioned and disposed to define the angular orientation of said platform means relative to said frame.

4,132,288

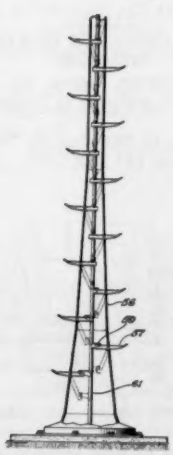
LADDER WITH RETRACTABLE RUNGS

William H. Bingham, 3508 W. Boyce Ave., Fort Worth, Tex. 76133

Filed Feb. 6, 1978, Ser. No. 875,310

Int. Cl.² E06C *1/387*

U.S. Cl. 182—156 **8 Claims**



1. A ladder with retractable rungs, comprising:

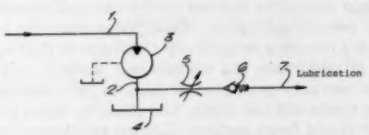
an elongated hollow housing having a series of apertures formed in the side wall;
a stem carried in the housing and longitudinally reciprocal with respect to the housing;
a plurality of rungs pivotally connected to the stem, each extensible through one of the apertures when the stem is moved upward to the open position, and retractable when the stem is lowered to the closed position; and
a supporting member pivotally carried inside the housing, the supporting member having a load bearing surface adapted to support the stem and being pivotal in a transverse plane, for selectively supporting the stem in the open position, and for allowing the stem to move downward to the closed position.

4,132,289

LUBRICATION ARRANGEMENT FOR THE BLADE CHAIN OF A FELLING SAW

Markku Mäkelä, Tampere, Finland, assignor to Rauma-Repola Oy, Finland

Filed Jun. 17, 1977, Ser. No. 807,672
Claims priority, application Finland, Jun. 18, 1976, 761780
Int. Cl.[2] F16N 7/14; A01G 23/08
U.S. Cl. 184—15 R **4 Claims**



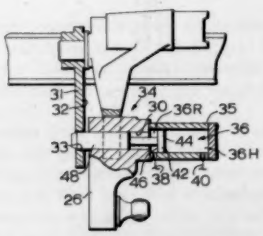
1. A lubricating system for a blade chain of a felling saw comprising:
a hydraulically operated motor;
a lubricant tank for receiving hydraulic oil from said hydraulic motor;
return flow pipe means for conducting oil from said hydraulic motor to said lubricant tank;
feed pipe means connected to said return flow pipe means for conducting at least some of the oil in said return flow pipe means to a blade chain; and
valve means for inhibiting the flow of oil in said feed pipe means in a reverse direction from said feed pipe means to said lubricant tank.

4,132,290

LOCKING MECHANISM FOR MOVABLE VEHICLE MEMBERS

Joseph E. Dezelan, Western Springs, and Donald R. Mast, Decatur, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 13, 1977, Ser. No. 759,219
Int. Cl.[2] B62C 7/02
U.S. Cl. 188—69 **4 Claims**



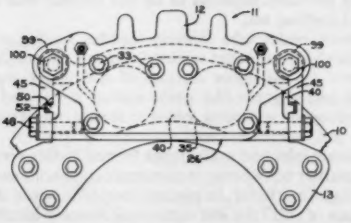
1. A locking mechanism adapted for an apparatus having a first member movable relative to a second member providing a plurality of spaced holes therein, comprising:
a housing secured to said first member having a chamber;
a piston having first and second surface areas, said first surface area being greater than said second surface area, said piston being movably positioned in the chamber;
a lock pin connected to said piston and extending outwardly from the housing, said lock pin being movable with the piston between a first position at which the lock pin is inserted into one of said holes and a second position at which the lock pin is displaced from said hole;
fluid means for moving the piston between the first and second positions and exerting fluid forces on both piston surface areas during movement of one member relative to the other said piston remaining at the first and second positions free of the fluid means; and
control means having a first operating mode for directing pressurized fluid against only the second surface area of said piston for exerting a retracting force on the lock pin of a first preselected magnitude and in a first preselected direction for retracting said lock pin while said first surface area is free of fluid pressure, a second operating mode for directing pressurized fluid against only the first surface area of said piston for exerting an actuating force on the lock pin of a second preselected magnitude and in an opposed second direction for extending said lock pin fixedly connecting said first member to said second member while said second surface area is free of fluid pressure, said second force being greater than said first force, and a third operating mode for directing pressurized fluid against both first and second surface areas of said piston for exerting an indexing force on the lock pin for automatically inserting said pin into an aligned one of said holes upon scanning of said member having said holes therein as may be required for said alignment, said indexing force being of a magnitude less than said actuating force and in the direction of said actuating force, said first and second members being movable one relative to the other in the third mode prior to inserting the pin into the aligned hole.

4,132,291

THRUST PLATE FOR CALIPER-TYPE DISC BRAKES

Philip A. Smith, Troy, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Jul. 17, 1975, Ser. No. 596,640
Int. Cl.[2] F16D 65/02
U.S. Cl. 188—73.6 **10 Claims**



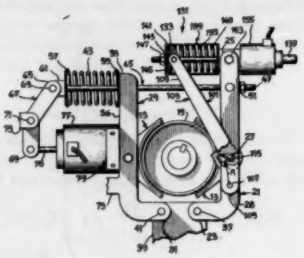
1. In a caliper type disc brake assembly comprising a nonrotatable caliper housing, a thrust plate, means to secure the thrust plate to an end of the housing, a friction member adapted to be retained within the housing by the thrust plate, and a brake disc extending into the housing and rotatable about an axis, the improvement wherein the means to secure the thrust plate to the housing comprises a pivot bolt extending in a direction substantially parallel to the axis of rotation of the brake disc, the thrust plate being pivotally attached to the pivot bolt, whereby the thrust plate can be rotated about the pivot bolt thereby allowing access to the friction member.

4,132,292

EMERGENCY BRAKE

Jacques Dufresne, 6889 Lamont St., Montreal, Quebec, Canada (H4E 2T8)

Filed Jul. 22, 1977, Ser. No. 818,225
Int. Cl.[2] F16D *65/21, 49/20*
U.S. Cl. 188—171 **13 Claims**



1. A brake arrangement, comprising:
a brake drum mounted on a shaft;
a fixed frame, located adjacent said brake drum;
first and second brake support means, each being pivotally mounted at one end thereof to said fixed frame;
a third brake support means pivoted at one end thereof to one of said first and said second support means;
a pair of brake shoes, arranged on opposite sides of said brake drum;
first connector means connecting one of said brake shoes with said third support means and said one of said first and second support means to which said third support means is pivoted, intermediate the ends of such support means, said first connector means being arranged as a lost motion connection whereby when said third support means and said one of said first and second support means to which said third support means is pivoted are fixed relative to each other said one brake shoe can be moved into and out of braking position by pivoting said one of said first and second support means, and whereby said one brake shoe can also be moved into and out of braking position by pivoting said third support means relative to said one of said first and second support means;
second connector means connecting the other of said brake shoes to the other of said first and second support means, intermediate the ends thereof;
first spring means mounted and arranged to bias the other ends of said first and second support means, and thus said brake shoes, toward each other in a braking action;
first actuating means connected to one of said first and second supports and with said first spring means, arranged to be selectively operable to act against said first spring means to maintain said brake shoes in a nonbraking position; and
second actuating means connected between the other ends of said third support means and said one of said first and second support means to which said third support means is pivoted, selectively operable to move said brake shoes to a braking position independently of said first actuating means.

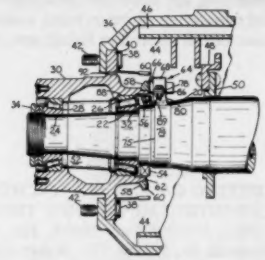
4,132,293

AXLE ASSEMBLY WITH SINTERED METAL ROTOR

Raymond J. Jovick, Troy, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 785,134, Apr. 6, 1977, which is a continuation of Ser. No. 661,147, Feb. 25, 1976, abandoned. This application Feb. 21, 1978, Ser. No. 879,550
Int. Cl.[2] B60T *8/08*
U.S. Cl. 188—181 R **1 Claim**

1. A vehicle axle assembly comprising an axle, means for rotatably mounting a ground engaging wheel at each end of the axle, a brake mechanism mounted to the axle adjacent each end thereof, each brake mechanism being operative when actuated to restrain rotation of a wheel rotatably mounted at that end of the axle, a valve having a body, means providing a source of pressurized fluid to the body, conduits connecting the body to the brake mechanism at each end of the axle, relay means within the body being operable when actuated to modulate fluid pressure from the source to the brake mechanism, a wheel speed sensor mounted at each end of the axle, an annular sintered metal rotor press fitted on a hub rotatably mounted on each end of the axle and supporting the wheel, wherein said hub is provided with an annular mounting surface coaxially with the rotational center of said hub and said wheel associated therewith, said sintered metal rotor being mechanically press fitted on said hub at said annular mounting surface, the said



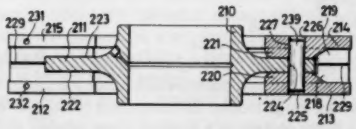
annular sintered metal rotor is a sintered iron rotor having a chemical composition by percent of iron from 97.7% to 100% and of carbon from 0% to 0.3% and having a density of between 6.4 grams per cubic centimeter and 6.8 grams per cubic centimeter, the rotor having a plurality of circumferentially and equally spaced notches, wherein said notches are disposed on a radially extending face of said rotor so that they radially emanate from the rotational center of said hub, the notches so disposed on the rotor to angularly sweep by the sensor, the sensor adapted to generate electrical signals indicative of the angular velocity of the rotor and in turn of the hub and said wheel associated therewith, means for modulating the operation of the relay valve mounted in the body comprised of electrical means mounted in the body and electrically connected to the wheel speed sensors.

4,132,294

BRAKING DISC WITH REPLACEABLE LININGS, FOR BRAKE-DISCS

Antonio Poli, Piazza Matte-otti, 10-Romanengo (Cremona), Italy

Filed Jul. 12, 1977, Ser. No. 814,890
Claims priority, application Italy, Jul. 23, 1976, 25645 A/76; May 10, 1977, 23383 A/77
Int. Cl.[2] F16D *65/12*
U.S. Cl. 188—218 XL **7 Claims**



1. A brake disc assembly comprising: a hub provided with circumferential radial flange means extending therefrom and having front and rear annular faces; at least two sector-shaped lining parts which together form an annular assembly, each part being of monolithic construction and including confronting front and rear sector-shaped linings, all of said sector-

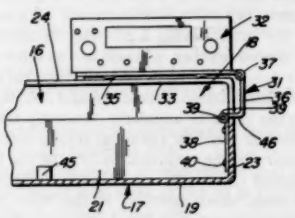
shaped linings forming together front and rear annular linings the outer surfaces of which will be acted on by braking jaws during use of the assembly, each of said parts being removably fitted over said flange means in concentric relationship with said hub so that said flange means lies between the opposed surfaces of the confronting front and rear sector-shaped linings, said linings having radially extending inner ribs projecting therefrom so as to form cooling passages open at both their radial inner and outer ends, at least some of said ribs having edges which serve as guides for said sector-shaped lining parts during fitting of the latter over said flange in a radial direction and during operation when thermal expansion occurs, said rib edges engaging said flange means in the completed brake disc assembly; and for each sector-shaped lining part a single removable connecting element extending parallel to the axis of said hub and connecting the respective lining part with said flange, each of said connecting elements being located approximately at the center of the respective lining part.

4,132,295

ARTICLE-CARRYING CASE AND ATTACHING AND ARTICLE-SUPPORTING HINGE UNIT THEREFOR

Jerrold J. Hochfelsen, North Miami Beach, Fla., assignor to Cresswell E. Stedman, Jr., Miami, Fla., a part interest

Filed Nov. 4, 1976, Ser. No. 738,684
Int. Cl.[2] A45C *13/00*; E05D *3/06*
U.S. Cl. 190—60 **23 Claims**



1. A hinge unit for attachment to a container which includes a body having side walls and a bottom wall and having a cover hingedly connected thereto and including a top wall, said hinge unit comprising:

(a) an attaching hinge section including means to rigidly attach to one of the walls of the said container;

(b) an article-supporting hinge section including means to attach mounted thereon and to be arranged with the said article or apparatus within the interior of the said container and including means to be arranged with the said article or apparatus on the top wall of the said cover;

(c) an intermediate hinge section between the said attaching hinge section and the said article-supporting hinge section including

(1) a body having

(2) opposite end portions;

(d) first hinge means hingedly connecting one of the said end portions of the said intermediate hinge section to the said attaching hinge section for movement of the said intermediate hinge section in a vertical plane relative to the said attaching hinge section and toward and away from the said container; and

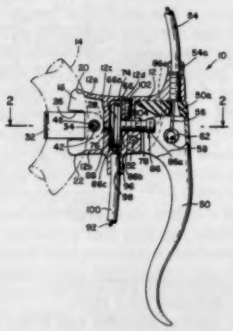
(e) second hinge means hingedly connecting the other end portion of the said intermediate hinge section for movement with the said article or apparatus supported thereon and with the said intermediate hinge section toward and away from the said container.

4,132,296

SHIFT LEVER AND INTEGRAL HANDBRAKE APPARATUS

Joel Evett, 64 Broad St., Boston, Mass. 02109

Continuation-in-part of Ser. No. 722,685, Sep. 13, 1976. This application Dec. 8, 1977, Ser. No. 858,689
Int. Cl.[2] B62K *23/06*; B62L *3/02*; F16D *13/00*
U.S. Cl. 192—4 R **10 Claims**



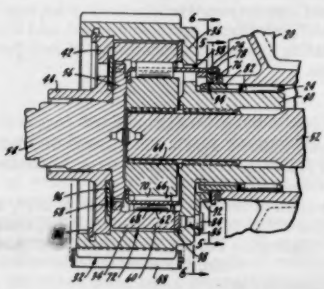
1. A shift apparatus and integral handbrake assembly adapted to mount on a handlebar comprising a handbrake housing on which pivots a handbrake lever, said housing being formed with a slot and having an interior region formed with a cavity, a flange integral with said housing and extending from the external periphery thereof, and flange being disposed on said housing so as to define a wall portion of said slot, a shift lever having one end formed as a shift barrel and the other end formed as a finger paddle, said shift barrel adapted to mount pivotally in said cavity, the last-mentioned mounting being such that a portion of said shift lever is disposed through said slot contiguous to said flange thereby to place said finger paddle extending from said housing, means for coupling said shift lever to a Bowden cable, means for placing a preset and controlled frictional drag on said shift barrel, and means for locking said frictional drag means at a given preset level whereby manual pressure on said finger paddle overcomes the drag placed on said shift barrel causing same to pivot thereby to effect a relative lengthening or shortening of the Bowden cable.

4,132,297

AUTOMATIC FOUR-WHEEL DRIVE SYSTEM

Richard T. Brown; Robert W. Halberg; John P. Simmons, and John W. Holdeman, all of Muncie, Ind., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Apr. 14, 1976, Ser. No. 676,774
Int. Cl.[2] F16D *41/02*
U.S. Cl. 192—36 **4 Claims**



1. Power transmission apparatus comprising first and second

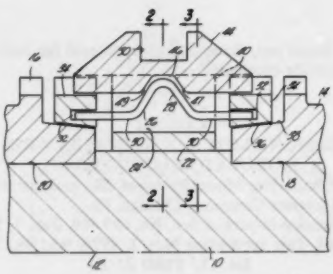
rotatable shaft means, said first shaft means including a first clutch race, an element loosely engaged with said second shaft means for rotation therewith and for axial movement relative thereto and relative to said first clutch race, said element defining a second clutch race, wedging means movable into and out of wedging engagement with said races, said wedging means establishing a first drive path between said shaft means when in said wedging engagement, and means establishing a second drive path between said shaft means, said last-mentioned means including friction means interposed between said first shaft means and said element, and means biasing said element axially into slipping contact with said friction means.

4,132,298

TRANSMISSION SYNCHRONIZER

Erwin F'Geppert, Novi, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 13, 1977, Ser. No. 815,349
Int. Cl.[2] F16D *23/04*
U.S. Cl. 192—53 B **1 Claim**



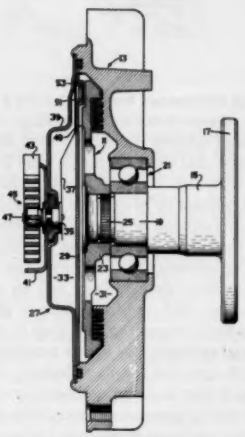
1. In a transmission comprising a drive shaft having a splined section; an internally splined shift collar keyed on the splined section of the shaft for axial movement therealong; axially spaced pinion gears freely rotatable on the shaft at opposite extremities of the splined section; a frusto-conical clutch element extending from each pinion gear in the direction of the shaft splined section; and an annular synchronizer clutch freely encircling each pinion gear clutch element, each synchronizer clutch having an internal annular clutch surface that mates with the frusto-conical clutch element whereby axial force on the respective synchronizer clutch causes same to grip the clutch element to thereby provide speed synchronization between the synchronizer clutch and associated pinion gear: the improvement comprising a number of similarly constructed spring elements operatively trained between the synchronizer clutches for exerting axial forces thereon after selected axial displacement of the shift collar from a centered position; each spring element comprising a central V section and straight end sections extending oppositely from the V extremities parallel to the shaft axis; the splined section of the shaft having a number of radial slots extending therealong, each spring element being captively oriented within one of the slots so that the plane of its V section is in a radial plane measured from the shaft axis; each synchronizer clutch having a number of axially directed blind holes in the end surface thereof nearest the splined section of the shaft, each spring element having one of its straight end sections extending into one of the blind holes; the radial slots and blind holes being sized to cooperatively preclude dislodgment of the spring elements from the axial space between the synchronizer clutches; the shift collar having a groove in its internal surface for normally containing the apex areas of the spring element V sections when the shift collar is in its centered position, the side surfaces of said groove constituting cams for exerting axial forces on the spring elements during axial displacement of the shift collar from its centered position; each spring element being formed of a single length of wire stock; the depth of the groove being such that the groove passes beyond the apex areas of the V sections before the splines on the collar reach the pinion gear in the collar path.

4,132,299

FLUID COUPLING DEVICE WITH IMPROVED DISENGAGED OPERATING CHARACTERISTICS

Douglas D. Rohrer, and Albert K. Blowers, both of Marshall, Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jun. 23, 1977, Ser. No. 809,216
Int. Cl.[2] F16D *35/00, 43/25*
U.S. Cl. 192—58 B **13 Claims**



1. A fluid coupling device comprising:

(a) a first rotatable member;

(b) cover means associated with said first member to define a fluid chamber therebetween;

(c) a valve plate disposed to separate said fluid chamber into a fluid operating chamber and a fluid reservoir chamber;

(d) a second rotatable member disposed in said fluid operating chamber and being rotatable relative to said first member, said second member having first and second wall surfaces oriented generally perpendicular to the axis of rotation of said members, and a generally annular outer surface extending between said first and second wall surfaces;

(e) valve means associated with said valve plate to control the flow of fluid between said reservoir chamber and said operating chamber and means associated with said valve means to effect the operation of said valve means in response to variations in a pre-determined condition;

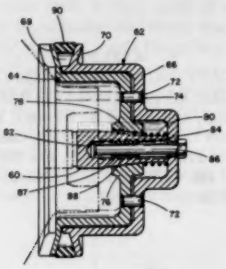
(f) said first member defining a generally annular inner surface, at least a major portion of said inner surface cooperating with said axis of rotation to define a first included angle; and

(g) at least a major portion of the outer surface of said second member cooperating with said axis of rotation to define a second included angle, said major portion of said outer surface and said major portion of said inner surface being closely spaced apart over at least a portion thereof, said second included angle being approximately equal to or greater than, said first included angle.

4,132,300
DISCONNECT MECHANISM FOR COMPRESSOR DRIVE

William M. Grandia, Jacobus, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 13, 1976, Ser. No. 749,941
Int. Cl.[2] F16D 9/00, 43/25
U.S. Cl. 192—82 T 7 Claims



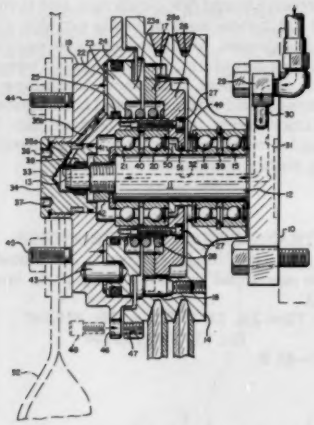
1. A disconnect mechanism between a rotary driving member and a rotary driven member comprising: a hub member associated with said driving member; a shaft associated with said driven member, said shaft having an axial bore; means for interconnecting said hub and said shaft including first and second members bonded to each other by means of a solder material which will unbond at some predetermined temperature; said means for interconnecting said hub and shaft further including a rod-like element associated with and driven by said hub member extending into said bore and an annular sleeve member surrounding said rod-like element and positioned between said rod-like element and said shaft in said axial bore, said solder material securing said sleeve member to one or the other of said shaft and said rod-like element; resilient means biasing one of said first and second members in a direction tending to effect disengagement of drive, said solder material holding said spring under compression below said predetermined temperature, but releasing above said predetermined temperature to disengage said hub member and said shaft.

4,132,301
FLUID ACTUATABLE FAN CLUTCH WITH INTERNAL CALIPER ACTION

Jerry L. Zabonick, Coldwater, Mich., assignor to Evans Products Company, Portland, Oreg.

Filed Mar. 21, 1977, Ser. No. 779,591
Int. Cl.[2] F16D 25/00
U.S. Cl. 192—85 AA 3 Claims

1. In a fluid-actuatable fan clutch having a sheave and a fan hub rotatably mounted upon a fixed shaft by means of sheave bearings and fan hub bearings, respectively, said sheave being adapted to be driven from a power source, and clutch means for drivingly connecting said sheave to said fan hub, said clutch means including an annular piston means in engageable relationship with an exposed face of an annular friction facing connected to an internal surface of said sheave in a manner such that at least an annular portion of both faces of said friction facing is exposed, the improvement comprising locating the cavity containing said piston in the face of said fan hub directed toward said sheave, locating a thrust cap in engageable relationship with the other exposed face of said annular friction facing and in alignment with said piston, and connecting said thrust cap to said fan hub by connecting means located between that portion of said thrust cap in alignment with said piston and said shaft and closely adjacent said fan hub bearings whereby, upon actuation of said piston into engagement with said friction facing and the engagement of said friction facing

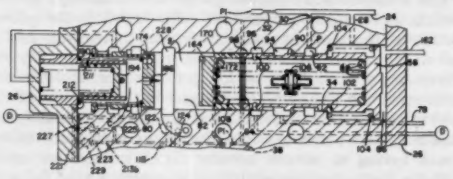


with said thrust cap, thrust forces upon said fan hub bearings are substantially eliminated.

4,132,302
TRANSMISSION CLUTCHES WITH FULLY-RESETTING MODULATOR-LOAD-PISTON

Probir K. Chatterjea, Mount Prospect, Ill., assignor to International Harvester Company, Chicago, Ill.

Continuation-in-part of Ser. No. 693,469, Jun. 7, 1976, abandoned. This application Nov. 2, 1976, Ser. No. 737,966
Int. Cl.[2] F16D 25/10
U.S. Cl. 192—87.13 9 Claims



1. A rate of rise hydraulic system having a connection to individual lines of a piston-type, transmission-clutch group, wherein the fluid output of the system undergoes pressure loss to an actual clutch fill pressure in order to pass from said connection through said individual lines to reach a selected clutch piston, said hydraulic system comprising:

a clutch pressure modulating valve and signal pressure control means both reciprocally mounted and in opposite ends of a bore formed by a valve housing, said clutch pressure modulating valve being arranged to afford flow of the system fluid output to said connection, out of pumped fluid supplied thereto from a pump source;

said signal pressure control means comprising a dump valve member reciprocally movable in an open-dump direction in toward, and in a closed-seated direction outwardly from, the adjacent end of the bore, and a differential pressure chamber defined between and by the dump valve member and said bore end;

said dump valve member cooperating with modulator loading means in said bore to define a signal pressure chamber;

a selector valve member disposed in said housing at said connection having spool valve portions effective in progressive selector valve positions for cooperating with said individual lines to direct system fluid output to selected ones of the clutch pistons; and

first (186) and second (122) means of connection leading from the dump valve member and selector valve member, respectively, utilizing first and second (116) branch sources of the system fluid output to supply therefrom rising signal fluid pressure to the fluid inside the signal pressure chamber;

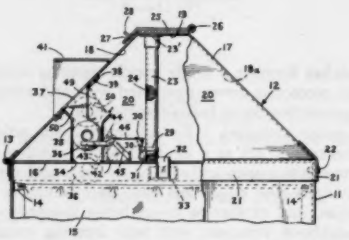
said first branch source utilized by the first means of connection comprising a restriction (227) therein hydraulically upstream of the dump valve member and first means of connection, in that order, to limit the dump valve in its outward direction of movement so as to seat without the sudden abruptness giving rise to transmission shift shock.

4,132,303

ARTICLE ACTUATED COIN DISPENSING CLOSURE FOR ARTICLE COLLECTING RECEPTACLES

Henry Stampleman, 79 Mountain Ave., New Rochelle, N.Y. 10804

Filed Apr. 13, 1977, Ser. No. 787,031
Int. Cl.² G07F 7/06
U.S. Cl. 194—4 F **1 Claim**



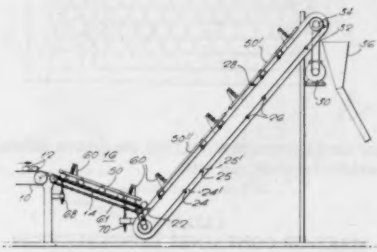
1. An article actuated coin dispensing closure unit for article collecting receptacles, said closure unit comprising a base plate of size and shape corresponding with the cross section of the receptacle to be associated therewith, a peripherally extending flange protruding downwardly from the base plate adapted to externally and telescopically engage said receptacle, lock means for interlocking said flange to said receptacle, a superstructure extending above said base plate and housing article receiving and coin dispensing means, said coin dispensing means being located centrally of said closure unit and comprising a vertically oriented coin storage chamber, an inclined chute adjacent the base of said chamber and extending to a coin pick-up station at one side of said closure unit, movable means for individually transferring a coin from the base of said storage chamber to said chute, guide means in said closure unit forwardly of said coin storage chamber forming a passageway having a contour profile that matches the article to be collected, said guide means extending downwardly through said superstructure to said base plate to establish a passageway to the associated receptacle, movable means extending into said guide means and linked to said movable coin transferring means in order to eject coins therefrom, lockable access means to said coin storage chamber provided at the top of said superstructure, an hinge that is peripherally spaced from said lock means for joining said closure unit to said receptacle, a plate having a profiled aperture formed therein and detachably secured to said superstructure to permit an interchange between plates having different profiled apertures in order to adapt the unit to accept and to reject the articles in response the profile of the aperture that is formed in said detachably secured plate, a spring tensioned flap hingedly mounted above, centrally of and longitudinally of said guide means providing a spring loaded and selectively openable closure for said guide means and a leaf spring having one end fixedly secured to said unit and the other, free end extending into said guide means.

4,132,304

ARTICLE COUNTING APPARATUS

Ernest C. Gent, Wisbech, and Stephen R. Watson, King's Lynn, both of England, assignors to A. E. Lenton (Wisbech) Limited, Lincolnshire, England

Continuation-in-part of Ser. No. 633,027, Nov. 18, 1975. This application Sep. 13, 1976, Ser. No. 723,029
Claims priority, application United Kingdom, Nov. 28, 1974, 51544/74; Jul. 10, 1975, 29138/75
Int. Cl.² B65G 47/26
U.S. Cl. 198—432 **16 Claims**



1. Apparatus for counting articles supplied thereto and releasing said articles in groups having the same number of articles in each group, comprising in combination:

means for supplying the said articles to a grouping station;

a plurality of guides at the grouping station separating the articles into a corresponding plurality of lines:

endless belt conveyor means, having mounted thereon upstanding fingers in lines abreast across the belt, the lines being spaced apart along the length of the belt, for removing from a first position in each of said lines of said articles the foremost articles in the lines and conveying the articles so collected to a collating device for dispensing the grouped articles in sequence instead of line abreast;

each of said upstanding fingers being hingably mounted to said endless belt conveyor means to occupy and be held in one of two selected positions, a first upright position in which an article at the first position of a line of articles in said grouping station will be removed by a finger as it passes the station and a second non-operative position in which a finger is in a lowered position parallel to the surface of the said endless belt so that it will not pick up an article as the grouping station is passed such that the width of the endless belt conveyor means bearing the upstanding fingers in line thereacross can be reduced for any of a number of articles to be counted; and

means for driving said endless belt conveyor means.

4,132,305

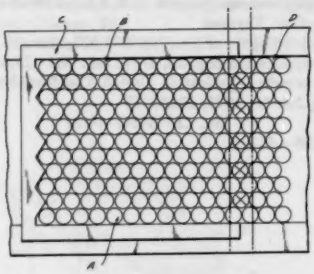
METHOD AND APPARATUS FOR REMOVING ARTICLES FROM BETWEEN LOAD PATTERNS IN A BULK PALLETIZER

Ned J. Mastak, Tavares, Fla., assignor to Acme Conveyor Company, Sanford, Fla.

Filed Oct. 25, 1977, Ser. No. 845,034
Int. Cl.² B65G 47/26
U.S. Cl. 198—432 **40 Claims**

22. Apparatus for removing articles between sets of articles to be formed into load patterns in a bulk palletizer or the like comprising a pattern forming area, first and second conveyor means, said first conveyor means conveying articles in a given direction to said pattern forming area, said second conveyor means conveying articles in a direction transverse to said given direction and being located in said pattern forming area along the interface between first and second sets of articles such that the trailing edge of the first set, the leading edge of said second set and the articles to be removed are initially situated on said second conveyor means and means for engaging and moving

said first and second sets respectively to locations remote from said second conveyor means such that actuation of said second



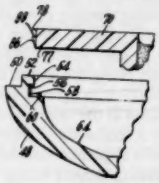
conveyor means causes removal from the pattern forming area of the articles between said sets.

4,132,306

MAKE-UP CONTAINER CONSTRUCTION

Herbert E. Margolin, East Northport, N.Y., assignor to Germaine Monteil Cosmetiques Corp., Deer Park, N.Y.

Filed Dec. 19, 1977, Ser. No. 861,763
Int. Cl.[2] A45C *11/00*; B65D *25/02*
U.S. Cl. 206—37 **8 Claims**



1. An improved make-up container construction to allow more economical utilization of the more expensive portion of the construction with a variety of different cosmetic inserts, comprising:

a. a make-up container having a wall

b. a recess defined in the wall

c. a make-up insert having a wall, the insert wall and the container wall being proximate to each other when the insert and the container are in cooperative engagement

d. an outwardly extending tapered lug secured to the insert wall and adapted to be permanently received within the recess

e. at least one of the two walls having sufficient resiliency to allow the lug to snap fit into the recess

whereby any one of the desired make-up inserts may be positioned within the container at the point of purchase, rather than the point of manufacture.

4,132,307

MATCHBOOK STRUCTURE

James A. Van Meter, 15357 Magnolia Blvd., Van Nuys, Calif. 91403

Continuation of Ser. No. 499,487, Aug. 22, 1974, abandoned. This application Feb. 26, 1976, Ser. No. 661,507
Int. Cl.[2] A24F *27/00*
U.S. Cl. 206—115 **1 Claim**

1. A matchbook structure comprising:

a sheet material back;

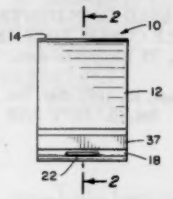
a sheet material cover, said cover movable from a closed position to an open position;

a grouping of matches, with said cover in said open position access for removal of one or more said matches is provided;

said back having an extension at its base edge which is bent over and secured by securing means to the base ends of said matches;

the improvement comprising:

a substantially rigid plastic protective cover to protect the heads of the grouping of matches from being ignited upon the ignition of a single match, said protective cover having a main section and side panels, said main section located directly adjacent said sheet material cover, said side panels substantially extending between said back and said cover when said cover is in said closed position, one each of said side panels located on each side of the heads of the



matches forming a single match encasing compartment, said protective cover connected with said extension;

said protective cover being transparent;

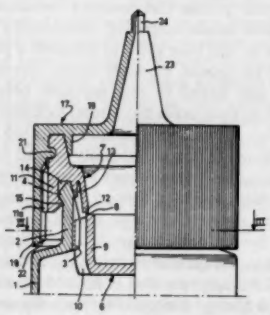
said cover including a line of several slits adjacent said extension to act as a hinge to assist pivoting the cover between the open and closed position; said main section having a base edge, said base edge having a U-shaped recess, said protective cover being inserted within said matchbook structure with said securing means located within said U-shaped recess not in contact with said base edge, said base edge of said cover being frictionally held between said base ends of said matches and said extension thereby permitting removal of said cover and reinstallation within another matchbook.

4,132,308

DISPENSING CONTAINER FOR STORING TWO PRODUCTS SEPARATELY AND DISPENSING THEM AS A MIXTURE

Antonin Goncalves, Groslay, France, assignor to L'Oreal, Paris, France

Filed Nov. 8, 1977, Ser. No. 849,720
Claims priority, application France, Nov. 15, 1976, 76 34311
Int. Cl.[2] B65D *25/08*
U.S. Cl. 206—219 **12 Claims**



1. A container for storing and dispensing a liquid product and an additional product isolated from one another during

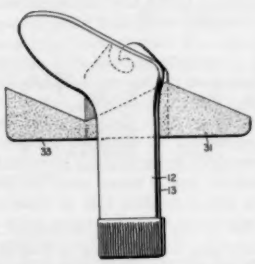
storage, and for dispensing a mixture of the said products, such container comprising a receptacle having a body and a neck, the body of the receptacle constituting a first compartment in which one of the products is placed; a capsule positioned in said neck, said capsule being in the form of a cup having a lateral wall disposed at least partially in said neck; a stopper covering said capsule and co-operating during storage with said capsule to define a second compartment in which said additional product is placed; external relief means on said cup lateral wall within said neck; internal relief means on said neck positioned to engage against said external relief means to hold said capsule against rotation with respect to said neck; retaining sleeve means adapted to engage said neck and to receive the said stopper externally thereon; means defining a rupturable peripheral wall zone joining said retaining sleeve means to said capsule whereby said capsule is carried by the retaining sleeve means; and means connecting said retaining sleeve means and said stopper for preventing rotation of the stopper relative to said retaining sleeve means.

4,132,309

HOSIERY PACKAGE

Harold H. Shaylor, Westfield, Mass., assignor to Westvaco Corporation, New York, N.Y.

Filed Jan. 12, 1978, Ser. No. 868,871
Int. Cl.[2] B65D *85/18;* H41D *27/22*
U.S. Cl. 206—278 **3 Claims**



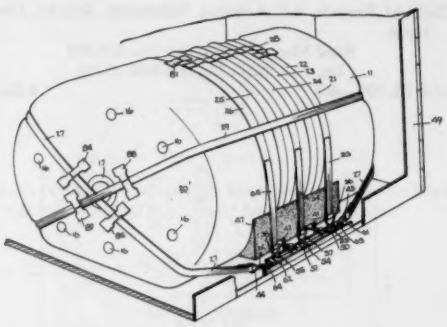
1. In combination, a pair of hosiery and means for packaging said hosiery for display on a pin type display rack comprising, an elongated blank of paperboard or the like having a continuous coating of pressure sensitive adhesive applied to one side thereof, said adhesive having the characteristic whereby it can be adhered to the hosiery, to itself, and/or to an uncoated portion of the blank, a pair of spaced apart and parallel score lines in said blank which divide the blank into a centrally located back panel having an upper portion and a lower portion and a pair of outboard side panels each of substantially the same size and shape, a pair of cut lines in said outboard side panels which divide said panels into a first pair of upper subpanels and a second pair of lower subpanels, the upper subpanels and the upper portion of said back panel each being provided with hook-shaped cutouts for accomodating the pin element of a pin type display rack, wherein the adhesive coated surfaces of said upper subpanels are bonded to one another and to the upper portion of said back panel to bring the cutouts into aligned condition and the adhesive coated surfaces of said lower subpanels are bonded to one another and to a pair of hosiery adhered to the lower portion of said back panel to encircle and retain together a matched pair of said hosiery.

4,132,310

SHIPPING SYSTEM FOR LIQUIDS AND POWDERS

Robert E. Dorsch, South Bend, Ind., assignor to Uniroyal, Inc., New York, N.Y.

Filed May 21, 1976, Ser. No. 688,655
Int. Cl.[2] B65D *19/38*
U.S. Cl. 206—386 **21 Claims**



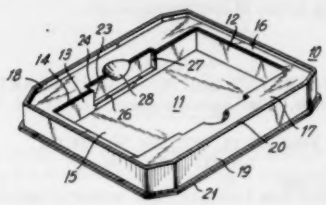
1. A shipping harness for securing a non-rigid container against movement on a platform support means comprising a plurality of continuous flexible straps forming closed loops for encircling the non-rigid container, each of said encircling straps spaced from each other by a plurality of flexible straps positioned across and attached to said encircling straps, at least some of said encircling straps having a pair of separate anchoring straps on opposite sides for holding the container on and in a fixed relation to said platform support means.

4,132,311

TAPE CARTRIDGE/CASSETTE RECEPTACLE

Floyd Glinert, Englewood Cliffs, N.J., assignor to Shorewood Packaging Corp., New York, N.Y.

Filed Sep. 29, 1977, Ser. No. 837,733
Int. Cl.[2] B65D *85/672*
U.S. Cl. 206—387 **4 Claims**



1. A receptacle for selectively alternatively holding a standard tape recording cartridge or standard tape recording cassette which are of rectangular configuration and of different dimensions, said receptacle being integrally formed and comprising a rectangular base wall and front and rear longitudinal and transverse side, peripheral walls projecting upwardly from the edges of said base wall and delineating an open topped cavity of a depth approximately equal to the height of said standard cartridge and in which said cartridge is nestable, said front and rear walls having formed in their confronting faces opposed transversely aligned rectangular recesses each of a height approximately equal to that of said standard cassette and bordered by side shoulders and a bottom shoulder disposed above said cavity base wall and provided with a base wall, the distance between the side shoulders of each recess being approximately equal to the width of said standard cassette and the distance between opposing recess bases being approximately equal to the length of said standard cassette, coplanar

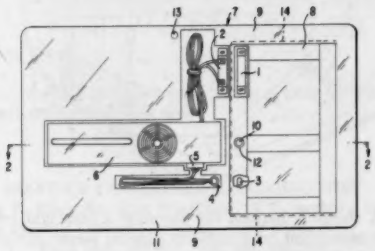
peripheral flanges projecting outwardly from the top edges of said peripheral walls and an upwardly directed peripheral lip projecting upwardly from the outer edges of said flanges.

4,132,312

PACKAGING UNIT FOR USE IN THE MARKETING OF ALARM SYSTEMS

Daikichi Kamada, 8-9, 3 chome, Nakahama, Joto-ku, Osaka, Japan

Filed Mar. 13, 1978, Ser. No. 885,633
Int. Cl.² B65D 73/00; G09B 25/00
U.S. Cl. 206—461 **4 Claims**



1. A packing unit for use in the marketing of compact alarm system comprising:

a flat supporting sheet, said flat supporting sheet including a smaller panel hingingly coupled to said supporting sheet along one edge;

at least one alarm actuating device provided on said panel adjacent an edge opposite to that coupled to said supporting sheet;

at least one actuation response device provided on said flat sheet adjacent said alarm actuating device;

at least one alarm device provided on said supporting sheet and coupled to said actuation response device such that said alarm device is actuated by the actuation response device; and

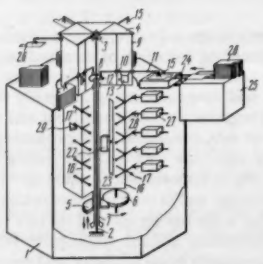
a means for fixing said alarm device and said actuation response device to said supporting sheet and for fixing the actuating device to said smaller panel.

4,132,313

AUTOMATIC DEVICE FOR SORTING FLAT ARTICLES

Ivan A. Kolosov, ulitsa Astrakhanskaya, 118, kv. 54, Saratov, U.S.S.R.

Filed Jul. 11, 1977, Ser. No. 814,276
Int. Cl.² B07C 5/04
U.S. Cl. 209—560 **2 Claims**



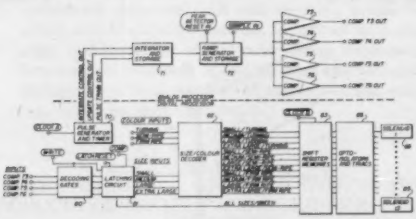
1. An automatic device for sorting flat articles, such as for selective assembly of storage battery electrode groups, comprising: a casing; a sorting drum installed vertically in the center of said casing and being intermittently turned by a drive from one sorting position to another; posts arranged the periphery of said drum, each post of said sorting drum being provided with a manipulator sliding freely on said post, each manipulator having a catch for fixing said manipulator in an uppermost position on its associated post; an actuating mechanism; a memory unit memory cells interacting with said actuating mechanism, each of said memory cells being made in the form of a group of arms, said arms being controlled by electromagnets of said actuating mechanism and assembled on a vertical axle under each of said posts, the number of groups of arms being equal to that of the groups of sorted articles, and stops, said stops being installed at each sorting position level with the arm corresponding to the position of the sorted group, each of said catches being controlled by any one arm of said memory cells of the memory unit, thereby ensuring distribution of the sorted flat articles in piles around the periphery of said casing at the sorting positions in accordance with associated parameters of said sorted articles; and a control instrument sending a sorting signal via said actuating mechanism to said memory cells.

4,132,314

ELECTRONIC SIZE AND COLOR SORTER

Joerg W. von Beckmann, 3206 W. 6th Ave., Vancouver, British Columbia, Canada, and Norman R. Bulley, Delta, Canada, assignors to Joerg Walter von Beckmann, Vancouver, Canada

Filed Jun. 13, 1977, Ser. No. 806,069
Int. Cl.² B07C 5/10, 5/342
U.S. Cl. 209—565 **16 Claims**

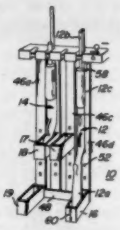


1. Apparatus for sorting objects according to size and colour comprising a conveying means having an overall reflectance in a pair of optical frequency bands less than any of the objects being sorted, sensing means comprising means to illuminate an object on said conveying means, means to receive reflected light from said object, and means to transmit portions of said reflected light to interference filters for isolation of optical signals in said pair of optical frequency bands, colour discriminating means having a means for detecting and converting said signals to electrical signals, means for amplifying said electrical signals, means for determining the ratio of said electrical signals, means for comparing said ratio with preset values to produce a signal representative of a particular colour category, size discriminating means having a voltage integrating means adapted to integrate a voltage proportional to the speed of the conveying means while the object is being sensed, means for comparing said integrated voltage with preset values to produce a signal representative of a particular size category, means for decoding said size and colour category signals to produce a resultant signal representative of a size and colour category, shift register means for storing said resultant signal and advancing said stored signal in accordance with the movement of the conveyer means, and eject means controlled by said shift register means and adapted to eject said object according to the size and colour category.

4,132,315
SECURITY RACK FOR WEAPONS

Bruce Young, Reading, Pa., assignor to BMR Security Products Corp., Richmond, Ky.

Filed Nov. 24, 1976, Ser. No. 744,830
Int. Cl.[2] E05B *73/00*; A47F *7/00*
U.S. Cl. 211—4 **11 Claims**



1. A security rack for a plurality of weapons each having a front and a butt portion, said front portion being formed of a first barrel section having a predetermined diameter and a second section having an increased diameter with respect to that of said first section comprising:

a plurality of butt housings each for receiving a butt portion of an individual one of said weapons,

a barrel enclosure housing displaced from said butt housings having a plurality of passages each for receiving a first section of an individual one of said weapons,

securing means fixed to a movable member operable for simultaneously blocking said passages for capturing and locking said first sections between said passages and said securing means,

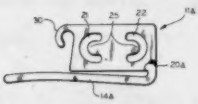
a strike member secured to said movable member, bar lock means movable within said barrel enclosure housing (1) for engagement with said strike member when said bar lock means is in a locked position thereby to constrain said securing means in a blocked position fo simultaneously blocking all said passages and (2) for disengagement from said strike member when said bar lock means is unlocked and pulled outwardly to an open position thereby allowing said securing means to be moved to an unblocked position, said strike member being concealed by said housing and said bar lock means in said blocked position and being concealed by said housing in said unblocked position, said strike member having an additional portion for engaging said bar lock means when the securing means is in the unblocked position and the bar lock means is moved to the locked position thereby to lock said securing means in the unblocked position.

4,132,316
DISPLAY AND CLAMP DEVICE

Joseph D. Schmidt, Jr., 1909 Lincoln Ave., Chicago, Ill. 60614

Continuation-in-part of Ser. No. 494,514, Aug. 5, 1974, abandoned. This application Jul. 9, 1975, Ser. No. 594,442
Int. Cl.[2] A47F *7/10*
U.S. Cl. 211—13 **4 Claims**

1. An integral two-part device consisting of hanger means attached to the bottom of a plate-like sorter part means having a hook extension projecting away from a side of the plate-like sorter part, said hanger and plate means having between them a mechanically weak local area adapted to be separated responsive to an application of a breaking force thereto, said plate member having a pair of openings through which at least two socks or like products may be pulled, to keep said two socks or like products together during laundry or storage, whereby said pair of socks or like products may be hung on said hanger means for point of purchase display, the center of gravity of said device being at the center of the hook when the pair of socks are hung on said hanger, said hanger means may be thereafter separated from said sorter, and said sorter may be used to hold together and in association with each other a pair

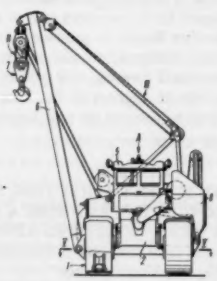


of socks or like products which have been individually fitted through said openings during said laundry or storage.

4,132,317
PIPE LAYING CRANE

Georgy A. Arendt; Vladimir V. Pokrovsky; Boris A. Burov; Alexandr L. Lipovich, all of Moscow; Evgeny I. Romanov, Zheleznodorozhny; Galina L. Vainshtein, Moscow, and Tsalel S. Khaitovich, Balashikha, all of U.S.S.R., assignors to Spetsialnoe Konstruktorskoe Bjuro Gazstroimashina, Moscow, U.S.S.R.

Filed Apr. 12, 1977, Ser. No. 786,836
Int. Cl.[2] B66C *23/72*
U.S. Cl. 212—49 **7 Claims**

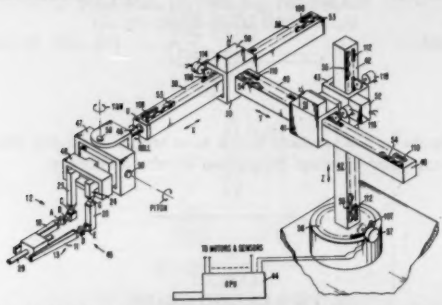


1. A pipe laying crane, comprising: a framework carrying an engine and a transmission and having a longitudinal axis; an undercarriage mounting said framework and made sectionalized from two track bogies arranged on both sides of said framework, one of said two track bogies being connected to the other with a possibility of setting motion with respect thereto in a direction perpendicular to the longitudinal axis of said framework so as to change the track gauge of said undercarriage the other of said two track bogies being fixed relative to said framework; articulated links interconnecting said bogies; and mounted equipment, comprising: a loading boom cantilevermounted on said one of said two track bogies of said undercarriage and a hanger carried by said loading boom for gripping the pipe being handled, a counterweight cantilevermounted on the other of said two track bogies of said undercarriage, a hoist mounted on said other of said two track bogies, and a system of tackles interlinking said hoist, said articulated links, said loading boom and said hanger for controlling the angle of the boom at any relative position of said bogie; said transmission having an extensible output unit adapted to transfer torque to said one of said two track bogies of said undercarriage.

4,132,318
ASYMMETRIC SIX-DEGREE-OF-FREEDOM FORCE-TRANSDUCER SYSTEM FOR A COMPUTER-CONTROLLED MANIPULATOR SYSTEM

Sherman S. Wang, Mohegan Lake; Michael A. Wesley, Somers, both of N.Y., and Peter M. Will, Norwalk, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1976, Ser. No. 755,900
Int. Cl.[2] G01L 5/16
U.S. Cl. 214—1 BB 13 Claims



1. A mechanical manipulator system including a gripper having a drive portion and at least a pair of opposed fingers for grasping objects, each of said fingers having a gripping portion with a gripping surface,

linkage means for connecting said fingers to said drive portion, each of said fingers having associated therewith a plurality of force sensors, with corresponding ones thereof having similar moment arms and an asymmetric relationship of the orientation of analogous sensors for said pair of fingers with the exception that at least one of said sensors on one of said fingers is substantially offset in location with respect to the moment arm of a corresponding sensor on another finger to provide substantially different moment force components whereby when an object is grasped between said fingers, said system is capable of measuring a number of degrees of freedom equal to the sum of the numbers of sensors on said fingers.

4,132,319
AUTOMATIC DEVICE FOR EXTRACTING STACKS OF FINISHED HOLLOW ARTICLES FROM A STACKING STATION OF A HEAT MOULDING APPARATUS

Pietro Padovani, Verona, Italy, assignor to Officine Meccaniche Veronesi (O.M.V.)S.p.A., Verona, Italy

Filed Apr. 13, 1977, Ser. No. 787,309
Claims priority, application Italy, Dec. 6, 1976, 84964 A/76
Int. Cl.[2] B65G 59/06; B29C 7/00; B66C 1/42
U.S. Cl. 214—1 BB 17 Claims

1. An automatic device for the extraction of stacks of finished hollow articles, heat moulded from sheets of plastic material, from a stacking station of a heat moulding apparatus, the device comprising:

a fixed frame extending between the stacking station and a discharge station, wherein the fixed frame is connected to the heat moulding apparatus and comprises at least two upper cross-pieces which are located above and adjacent to the stacking and discharge stations, and are connected together by at least two bars;

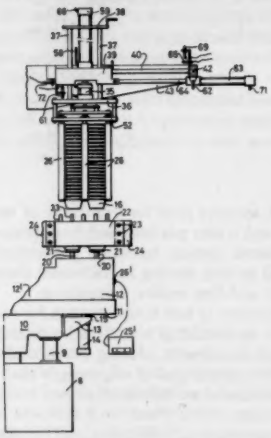
a carriage mounted on the two bars and guided thereby for horizontal displacement;

retaining means carried by the carriage for enabling engagement and disengagement of the stacks, the retaining means including vertical engagement rods having radial projections on lower ends thereof for retaining the stacks therebetween and the engagement rods being rotatable about longitudinal axes thereof;

means connected to said carriage for enabling vertical displacement of the rods;

means connected to the fixed frame for enabling horizontal displacement of the carriage;

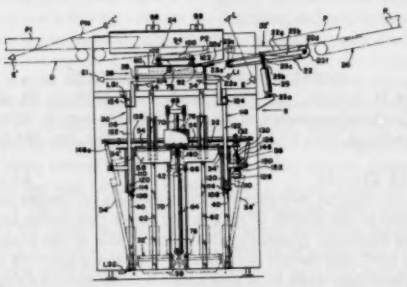
operating means including a first double-acting piston and a second double-acting piston wherein the first piston has a cylinder which is connected to the rod of the second double-acting piston and the second double-acting piston has a cylinder which is directly mounted on the carriage; the operating means further including a first plate secured to the cylinder of the first piston, a second plate connected to the first plate by means of spacer sleeves, shafts extending from the upper end of the engagement rods and being rotatably mounted in the second plate, a third plate positioned between the first and second plates and supported by the rod of the first piston, the third plate being provided with through bores receiving the shafts of the engagement rods, cam means formed on the shaft of the engagement rods and engaged by cam drive means on the third plate which rotate the shaft and the engagement rod so as to engage the radial projections on the engagement rods with the stacks of articles to retain the articles between the engagement rods.



4,132,320
PAN STACKING SYSTEM

George R. Cournoyer, Bridgeport; Robert E. Woody, and John R. Baker, both of Saginaw, all of Mich., assignors to Baker Perkins Inc., Saginaw, Mich.

Filed Apr. 22, 1977, Ser. No. 789,772
Int. Cl.[2] B65G 57/06
U.S. Cl. 214—6 H 16 Claims



1. Pan stacking mechanism comprising infeed means for uninterruptedly feeding baking pans to a stacking station at the upper end of a vertical path; receiving means at said stacking

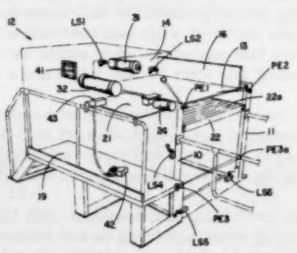
station for receiving a pan from said infeed means, aligning the received pan with said vertical path and dropping said pan; first pan stack support means mounted for raising and lowering movement along an upper section of said path; said first pan stack support means having first opposed pan engaging means movable from opposite sides of the path between an operative position wherein said pan engaging means project into said path to support the opposite ends of pans thereon and laterally retracted inoperative positions clear of said path; means for moving said opposed pan engaging means laterally; means mounting said first pan engaging means for vertical indexing travel; first indexing means, operable independently of said means for moving the first pan engaging means laterally, operating discontinuously in increments of vertical travel responsive to the dropping of a pan by said receiving means for lowering said first pan engaging means a predetermined distance equal to the height of a pan to form a stack of pans on said first pan engaging means; second pan support means mounted for raising and lowering movement along a lower section of said path vertically overlapping the lower portion of said upper section, first control means operable upon the lowering of said first support means below the upper end of said lower section of said path for retracting said first pan engaging means laterally to said inoperative position upon transfer of the support of the stack of pans from said first pan engaging means to said second support means; means for returning said pan engaging means to the upper end of said upper section of said path; second indexing means operable discontinuously in increments of vertical travel when a stack of pans is supported on said second support means for lowering said second support means a predetermined distance equal to the height of a pan responsive to the dropping of a pan by said receiving means; second control means operable after the assembly of a stack of a predetermined number of pans on said second support means to restore said first pan engaging means to said operative position; means for discharging stack assembly from the second support means; and means for returning said second support means to raised position.

4,132,321

PALLETIZER WITH CONTROLLED STACK DENSITY

Paul D. Bowlby; James M. Cinkoske, both of Indianapolis, and Richard D. Harris, Shelbyville, all of Ind., assignors to Economation, Inc., Indianapolis, Ind.

Filed May 9, 1977, Ser. No. 795,091
Int. Cl.² B65G *57/24*
U.S. Cl. 214—6 DK **2 Claims**



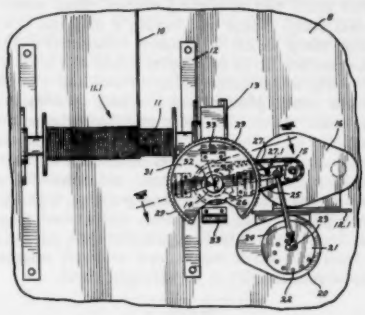
1. In apparatus for stacking bundles of flattened corrugated containers or the like into unit-loads, the apparatus being of the type in which each tier of the stack is initially placed on an extended but horizontally retractable stripping plate which, when retracted, drops the tier on a vertically movable elevator bed disposed directly below the stripping plate, said apparatus including means for sensing the presence of the upper margin of the top tier of bundles on said elevator bed with the sensing means being disposed closely adjacent the underside of the stripping plate, and power means having a bed elevating and lowering mode controlled by said sensing means for lowering said elevator bed upon retraction of the stripper plate an amount sufficient to clear the upper margin of the top tier of bundles on the elevator bed with respect to said sensing means, the improvement comprising control means operable after the stripping plate is again extended for maintaining said power means in its bed elevating mode for a predetermined adjustable time interval to thereby compress the stacked bundles on the elevator bed against the underface of said stripper plate, said control means including a manually adjustable timer for determining said adjustable time interval.

4,132,322

SILO UNLOADER WINCH DRIVE

Leo J. Loesch, and Claude E. Loesch, both of Rte. 1, Kimball, Minn. 55353

Filed Apr. 18, 1977, Ser. No. 788,227
Int. Cl.² B65G *65/38;* B66D *1/24;* F16H *37/06*
U.S. Cl. 214—17 DB **14 Claims**



1. A drive mechanism for a cable, comprising
a winch including a drum upon which such a cable is wound and payed out and a speed-reducing gear mechanism including an input shaft to revolve a worm,
a reversible motor having an output shaft connected to the input shaft by chain and sprockets to rapidly revolve the input shaft and drum,
a slow speed motor with an output eccentric,
an oscillatable drive arm freely mounted on one of said shafts for rocking movement and having a drive pawl thereon, the drive arm being connected to the output eccentric of the slow speed motor,
a ratchet wheel of magnetic material on said one shaft and being freely rotatable with respect to said one shaft, the ratchet wheel engaging the drive pawl to be rotated thereby, and
a drive plate affixed to said one shaft and rotatable therewith in face-to-face and spaced relation to the ratchet wheel, the plate having a plurality of magnets affixed thereto and bearing against the side of the ratchet wheel and defining a releasable drive connection to the ratchet wheel.

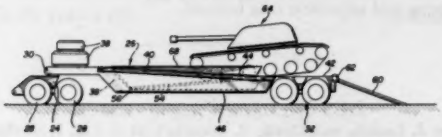
4. A drive mechanism for a winch with a worm gear speed reducing mechanism, comprising
a reversible motor having a non-slip driving connection for coupling to such a speed reduction mechanism,
a rotary coupling means in driving relation to said driving connection,
a rotary driver adjacent the coupling means,
powered means incrementally and repeatedly turning the rotary driver and including a source of oscillating motion, and
a clutch between the rotary driver and the coupling means and having a torque responsive slip characteristic to slip in response to predetermined torque applied therethrough.

4,132,323

COMBINATION TANK TRANSPORTER AND GENERAL CARGO TRAILER

Lovel R. Simmons, P.O. Box 1206, Jackson, Mich. 39205

Filed Oct. 25, 1977, Ser. No. 844,980
Int. Cl.[2] B60P *3/06*
U.S. Cl. 214—85 **11 Claims**



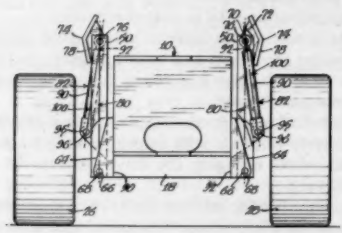
1. A wheeled transporter for a vehicle such as a tank comprising elongated frame means, wheel means at the front end thereof and wheel means at the rear end thereof disposed for engagement with a supporting surface for movement of said transporter along said supporting surface, ramp means at one end of said frame means and having a diagonal position in which said ramp means is inclined substantially from said supporting surface up to said frame means at a level adjacent the top of the wheel means adjacent one end of said frame means, floor means, pivot means pivotally securing said floor means adjacent one end thereof to said frame means relatively adjacent to the end of said frame means opposite to said ramp means, said pivot being at a level below the aforesaid level adjacent the top of said wheel means, and means for pivoting said floor means between traveling position with said floor means substantially horizontal and vehicle-loading position with said floor means in inclined position with the end thereof remote from said pivot means and relatively adjacent said ramp means substantially at the aforesaid level.

4,132,324

STABILIZER ASSEMBLY

Elton B. Long, Burlington, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Dec. 29, 1977, Ser. No. 865,733
Int. Cl.[2] B60S *9/10*
U.S. Cl. 214—138 R **13 Claims**



1. A stabilizer assembly for a construction vehicle having a frame with at least one set of wheels and at least one material handling implement operatively associated with said frame, comprising:

at least one elongated stabilizer arm having one end pivotally connected to the frame about a fixed stabilizer pivot point and another end movable from a ground engaging position extending laterally beyond one of said wheels for providing lateral stabilization and support of said vehicle during operation of said material handling implement, to a generally upright over-center transport position during movement of said vehicle, and defining a pivotable stabilizer axis extending between said one end of said stabilizer arm and said other end of said stabilizer arm; and

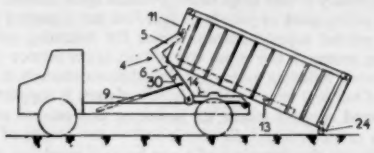
fluid cylinder means pivotally connected to said frame about a fixed fluid cylinder piovt point and operatively connected to said stabilizer arm at a location spaced from said fixed stabilizer pivot point for moving said stabilizer arm from said ground engaging position to said over-center transport position, said fixed fluid cylinder pivot point being positioned laterally outward of said fixed stabilizer pivot point and said fluid cylinder means defining a pivotable fluid cylinder axis extending through the connections to said frame and said stabilizer arm, and said pivotable fluid cylinder axis being located laterally outward of said pivotable stabilizer axis when said stabilizer arm is in said over-center transport position.

4,132,325

LOADING MECHANISM FOR A MULTIPLE USE CONTAINER

Antoine Corompt, LaMetare-Rue Rembrandt, Saint Etienne (Loire), France

Filed Jul. 13, 1977, Ser. No. 816,507
Claims priority, application France, Jul. 13, 1976, 7622027
Int. Cl.[2] B60P *1/64*
U.S. Cl. 214—515 **10 Claims**



1. A loading mechanism for loading a multiple use container on a lorry and chassis, said cntainer housing being parellelepiped and conforming to the rules of the international standard known as "ISO", said loading mechanism comprising:

a moveable framework having one end and an opposite end hingedly articulated to the chassis of the lorry;

a collapsible handling arm having an upper portion and a lower portion, said lower portion having one end slidably and hingedly mounted to said moveable framework, said upper portion having one end terminating in engaging means;

first means for actuating said handling arm, said first actuating means having one end hingedly attached to said lower portion of said handling arm and an opposite end hingedly mounted to said lorry;

second means for actuating said handling arm, said second actuating means mounted to said framework and said lower arm such that when said container is loaded upon said lorry said second actuating means moves said container along said lorry betwen a first and a second position;

said container housing having a tunnel housing juxtaposed said handling arm and said framework such that when said container is placed on said lorry said handling arm and said framework are positioned within said tunnel housing; and

means for interlocking said container with said lorry, said interlocking means positioned on said framework and said housing tunnel to lock said container to said lorry during transport of said container.

4,132,326

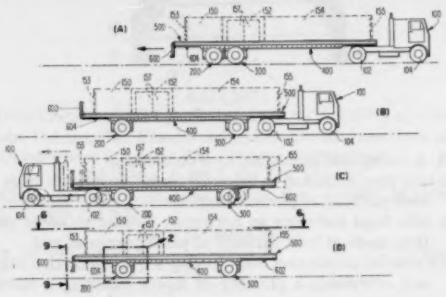
MULTIPLE HOOK-UP, MOVABLE AXLE, CONTAINER CARGO TRAILER

Robert R. Pinto, 2900 Federal St., Camden, N.J. 08105

Filed Apr. 18, 1977, Ser. No. 788,182
Int. Cl.[2] B60P *1/52, 7/08*; B62D *53/08*
U.S. Cl. 214—515 **9 Claims**

1. A cargo trailer for receiving, positioning, retaining and transporting cargo laden containers, said trailer being coupleable with a tractor at least during the hauling thereof, said

trailer comprising: a substantially elongate cargo bed, and a pluraliy of axle means relatively slidable with respect to said bed between at least a stored position for independently supporting said cargo bed and any of a variety of preselected transport positions for selectively distributing at least a portion of the weight of said bed and cargo thereon relatively between each of said axle means and relatively onto said trailer for hauling, said plurality of axle means being relatively slidable with respect to each other, as well as with respect to said bed, said trailer further comprising a plurality of means, at least one at each end of said bed, for coupling with said tractor, said means defining coupling positions at each end of said bed



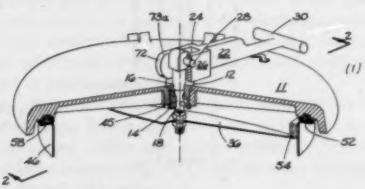
having kingpins disposed therein mounted to the undersurface of said bed, said bed further comprising track means disposed along the undersurface of said bed spanning between said coupling positions and terminating at said coupling positions to define first and second tractor clearance lengths in the vicinities of said kingpins between the ends of said track means and the ends of said elongate bed, said first of said tractor clearance lengths disposed at a first end of said elongate bed being relatively longer than the second of said tractor clearance lengths, whereby differential maximum bridging distances may be obtained depending upon the kingpin selected for coupling to said tractor.

4,132,327

HATCH COVER OPENING AND CLOSING ASSEMBLY

Ronald D. Van Dyke, Florissant; James C. Hammonds, and Patricia S. Stoller, both of St. Charles, all of Mo., assignors to ACF Industries, Inc., New York, N.Y.

Filed May 1, 1978, Ser. No. 901,339
Int. Cl.² B65D *45/00*
U.S. Cl. 220—244 **19 Claims**



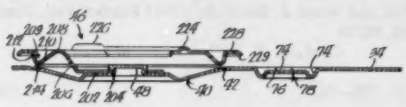
1. A hatch cover opening and closing assembly comprising: a hatch cover pivotably mounted relative to a hatch coaming; a locking handle having an inner end pivotably mounted about a vertically extending shaft located in the center portion of said cover; said shaft extending downwardly through said cover and through a guide depending from said cover; said guide including at least one generally vertical indexing slot; a laterally extending shaft pin attached to said shaft; a plurality of radially extending locking arms attached to said shaft; a plurality of locking lugs mounted on the internal surface of said hatch coaming; said shaft being rotatable by the handle to move said locking arms radially relative to said locking lugs, and to move said shaft pin into said indexing slot; said shaft further being movable vertically to move said locking arms into and out of engagement with said locking lugs.

4,132,328

PANEL WITH OPENING MEANS

Arthur P. Zundel, Mt. Prospect, Ill., assignor to National Can Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 789,096, Apr. 20, 1977, abandoned. This application Jan. 30, 1978, Ser. No. 873,547
Int. Cl.² B65D *41/32*
U.S. Cl. 220—267 **39 Claims**



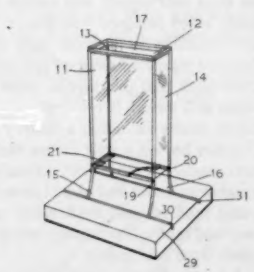
1. In a sheet metal end closure including a substantially flat wall portion having a removable section therein and an inner surface and an outer surface with the removal means permanently connected to said wall portion, said wall portion having a flat annular reduced portion with a score in said flat annular reduced portion defining said removable section, said score defining a reduced thickness of residual between said removable section and said wall portion, said residual having a substantially constant maximum thickness along a major portion thereof and at least one portion of less thickness than said major portion along a minor portion thereof, said removal means having a greater peripheral dimension than said removable section and having severing means for initially severing said at least one portion and subsequently said major portion of said residual.

4,132,329

DISPENSER FOR PLASTIC CARDS

Ronald G. Harrison, 21 Cunningham Rd., Sault Ste. Marie, Ontario, Canada

Filed Nov. 7, 1977, Ser. No. 849,075
Int. Cl.² B65H *1/00*
U.S. Cl. 221—45 **9 Claims**



1. A dispenser usable for storing and dispensing plastic cards comprising,

a generally rectangular housing having an open bottom, mutually spaced front panel and rear panel provided with integral extension portions extending below said open bottom to form supporting legs therein,

a sliding panel slidably mounted at said open bottom, one side panel of said housing having a lower end provided with a horizontal portion and a slanted portion sloping upwardly away from said open bottom towards said front panel,

said sliding panel having an end portion provided with a cut-out end portion operatively located below said slanted portion of said one side panel, and a straight edge portion operative to abut said horizontal portion of said lower end

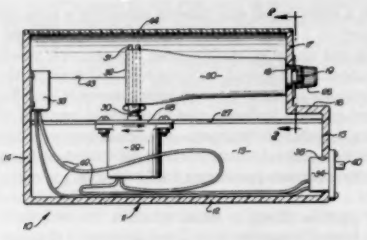
of said one side panel when said sliding panel is fully mounted at said open bottom.

4,132,330

MOTOR POWERED PASTE DISPENSER

Dean C. Rauscher, 684 Greenwood Ave., Devore, Calif. 92407; Robert A. Grozier, 841 E. Mt. View St., Glendora, Calif. 91740, and Frank J. Rauscher, 17842 Fairfax Ave., Fontana, Calif. 92335

Filed Jul. 5, 1977, Ser. No. 812,728
Int. Cl.[2] B65D *35/34*
U.S. Cl. 222—76 2 Claims



1. In a device for dispensing a fluent paste confined in a flexible tube sealed shut at one end, through a nipple provided at its opposite end, the combination of:

electromotive means for applying torque to said shut end of said tube about a transverse axis to wind up said tube and to extrude paste from said nipple;

a solid state electronic circuitry for controlling said electromotive means;

a single on-and-off push button switch means which, when actuated, to turn it on, functions through said circuity to cause said electromotive means to wind-up on said tube to extrude paste from said nipple, said switch being turned off immediately when released whereupon said circuity automatically functions to reverse said electromotive means to relax said rotary winding on said tube for a brief period, to draw back into said nipple, paste left hanging therefrom when said switch is released,

said electromotive means including a battery powered reversible DC motor having a gear driven shaft;

split shaft means co-axially fixed on and driven by said motor shaft and engaging said shut end of said paste filled tube so as to wind said tube on said shaft while said nipple is uncovered and said motor is positively energized, thereby dispensing paste from said nipple;

cabinet means for immobilizing said nipple while guiding said motor for free movement directly towards and away from said nipple during the operation of said device;

said cabinet means having an end wall, side walls, and a pair of guide tracks formed in parallel opposing relation on the inner faces of said side walls;

means for mounting said nipple of a dentifrice paste confining tube in said end wall to extend outwardly through said wall and be fixed therein with said tube disposed in parallelism with and equidistant from said tracks; and

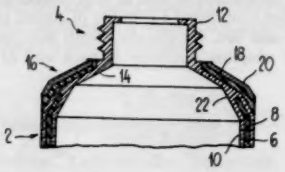
platform means slideably interlocking with said tracks and having said motor mounted thereon to guide said motor with said tube winding shaft of said motor intersecting the lengthwise axis of said tube and winding said tube on said shaft to extrude paste from said nozzle while said switch is being actuated.

4,132,331

COLLAPSIBLE PACKING TUBE

Karl Mägerle, Im Vorderen Erb 1, 8700 Kusnacht, Switzerland

Filed Jun. 22, 1976, Ser. No. 698,783
Claims priority, application Switzerland, Jun. 27, 1975, 8370/75; Nov. 5, 1975, 14251/75
Int. Cl.[2] B65D *35/10*
U.S. Cl. 222—107 16 Claims



3. A collapsible packaging tube comprising:

a tube pipe, including an inwardly turned upper end, made at least partially of plastic material,

a tube head including an outwardly sloping shoulder portion, made at least partially of plastic material, and

an annular connecting body having a truncated cone shape and containing a plurality of layers including a barrier sheet,

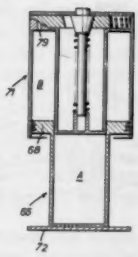
said body being welded in a position between a side of said inwardly turned upper end of said tube pipe and an opposing side of said outwardly sloping shoulder portion of said tube head so as to be welded to said shoulder portion at at least a location radially inwardly of its weld to said upper end of said tube pipe.

4,132,332

CONTAINERS FOR PRESSURIZED FLUIDS, IN PARTICULAR FOR DISPENSING AEROSOLS

Victor Wassilieff, 84, Rue de l'Assomption, 75016 Paris, France

Continuation of Ser. No. 414,135, Nov. 8, 1973, abandoned. This application Apr. 25, 1977, Ser. No. 790,680
Claims priority, application France, Nov. 14, 1972, 72.40290
Int. Cl.[2] B65B *3/04;* B65D *83/14*
U.S. Cl. 222—387 38 Claims



15. A container for distributing pressurized flowable material, said container comprising a first chamber for receiving the material, provided with a valve-controlled outlet and a first mobile wall portion, and a variable volume self-contained vacuum second chamber for holding vacuum provided with a second mobile wall portion having two opposite faces which are exposed one to sub-stmospheric pressure from the vacuum chamber and the other to at least atmospheric pressure, with means linking said mobile wall portions together for simultaneous movement so as to cause simultaneous variations of the same sign in the volumes of both chambers, whereby the combined effect of said sub-atmospherica pressure and at least atmospheric pressure on said second wall portion is operative

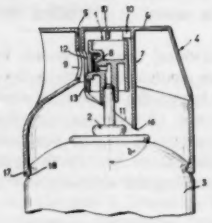
through the agency of said first wall portion in permanently pressurizing material in the first chamber and causing a quantity thereof to be ejected from said first chamber when said valve-controlled outlet is open, each such ejection causing simultaneous reductions in volume in both first and second chambers, with the material left in the first chamber after each such ejection remaining pressurized.

4,132,333

DISPENSING UNIT FOR AN AEROSOL CONTAINER

André Debard, Buc, France, assignor to Aerosol Inventions and Development S.A. AID SA, Fribourg, Switzerland

Filed Dec. 2, 1976, Ser. No. 746,687
Claims priority, application France, Dec. 3, 1975, 75 36937; Sep. 9, 1976, 76 27084
Int. Cl.² B65D *83/14*
U.S. Cl. 222—402.13 7 Claims



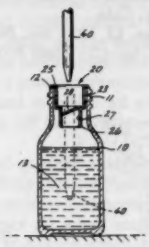
1. A dispensing unit for an aerosol container, comprising:
an actuator adapted to be connected to a valve on the container to actuate said valve, said actuator comprising a lateral spray-discharge nozzle and passage means for delivering fluid from the valve to said nozzle;
a protective cover having an upper section, and a depending skirt, said cover being adapted to fit coaxially over said actuator and be secured by said skirt on the container in a circumferentially oriented position relative to the actuator in a manner permitting manual operation of said actuator, said protective cover having a spray-discharge opening in said upper section which opening is located in front of said nozzle when said cover is in said oriented position with respect to said actuator;
orienting means to orientate said cover with respect to said actuator when fitting said cover on said container comprising means within said cover providing two helical ramps and a cooperating lug on said actuator circumferentially aligned with said nozzle;
a slot formed through said cover and extending in an axial direction from said opening to said ramps for sliding movement with said lug when the cover is in the oriented position, said slot being aligned with said opening and said nozzle when in the oriented position such that the spray-discharge from said nozzle passes through said slot and then through said opening, and an axial sleeve in said cover having at least a semi-cylindrical shape and having sliding engagement with said actuator during orientation of said cover, said ramps being formed by a bottom edge of said sleeve and extending symmetrically helically upwardly to said slot with an angle of slope of at least 45° with respect to the axis of the cover.

4,132,334

SPILL AND TAMPER RESISTANT SAFETY CLOSURE

Barbara A. Danks, Gurnee, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed May 9, 1977, Ser. No. 794,766
Int. Cl.² B65D *5/72*
U.S. Cl. 222—490 5 Claims



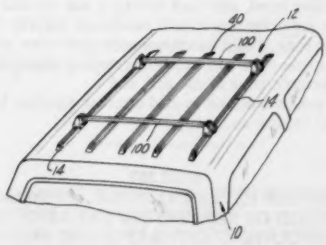
1. A spill and tamper resistant safety closure for a container having an opening or neck portion comprising;
an integrally formed element defining a container-engaging body portion and a depending portion extending from the engaging portion, both said container-engaging body portion and said depending portion having a wall member forming a continuous passageway therethrough, said passageway including an opening into the container,
a movable valve member positioned within said passageway distal from the opening and extending inwardly from the walls thereof and hingedly secured inside said safety closure, said hinging being effected solely by means of an integral connection between the wall of the closure and said movable valve member, the valve member conforming to the configuration of the depending portion and being of a length longer than the width of the passageway,
said container-engaging body portion adapted to sealingly fit inside the neck portion of said container in fluid tight engagement therewith.

4,132,335

SLIDABLE BRACKET FOR ARTICLE CARRIER

Charles E. Ingram, Warren, Mich., assignor to Four Star Corporation, Troy, Mich.

Filed Sep. 27, 1977, Ser. No. 836,966
Int. Cl.² B60R *7/00*
U.S. Cl. 224—42.1 F 19 Claims



1. A tie-down bracket for an automotive vehicle mounted article carrier having at least one slat affixed to the vehicle, the improvement comprising:
(a) a base section engageable with the slat;
(b) an upper section for facilitating securement of articles carried on the carrier;
(c) the upper section being interconnected to the base section,
(d) means for releasably locking the bracket in a pre-selected

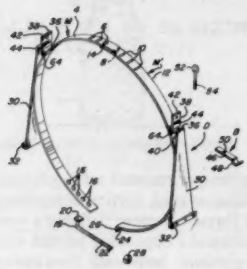
position along the length of a track formed in the slat and comprising a member which is urgeable into engagement with a base formed in the track.

4,132,336

TIRE MOUNTED SUPPORT BRACKET FOR VEHICLE ACCESSORIES

Dennis J. Leinaar, Boulder, Colo., assignor to Raaniel Industries, Inc., Boulder, Colo.

Filed Jan. 13, 1977, Ser. No. 759,010
Int. Cl.² B60R 9/06
U.S. Cl. 224—42.13 **8 Claims**



1. A support device for a vehicle accessory which is attachable to the tread of a spare tire mounted on the exterior of a vehicle, said device comprising:

a circular member including a pair of generally elongate semicircular bands each having a first and second end and an inner surface;

a series of slots spaced along each of said bands from said first end thereof;

a flange extending substantially at right angles from said first end of each of said bands engageable with selected ones of said slots in the other of said bands thereby interconnecting said first ends of said bands;

a series of holes spaced longitudinally along one of said bands from said second end thereof;

a flange extending substantially at right angles from said second end of the other of said bands and having a hold therethrough;

a bolt having a right angle bend adjacent one end, said end having a flat head thereon and the other end of said bolt being threaded, said bolt being positionable through one of said series of holes with said flat head lying against the inside surface of said second end and the other end extending through the hole in said flange on said second end of said other band, said bolt having a nut on said threaded end to apply tension to said bands and thereby draw said second ends of said bands towards each other to hold the inner surfaces of said bands in gripping engagement with the circumference of the tire; and

bracket means attached to said circular member for attaching the vehicle accessory.

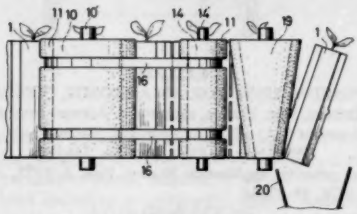
4,132,337

CONTINUOUS PAPER CYLINDER ASSEMBLY AND METHOD OF SEPARATING THE SAME AND TRANSPLANTING APPARATUS FOR THE SAME

Akiyoshi Masuda, and Tetsuo Nambu, both of Obihiro, Japan, assignors to Nippon Tensai Seito Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 15, 1977, Ser. No. 768,749
Claims priority, application Japan, Mar. 2, 1976, 51-21766; Nov. 12, 1976, 51-135183
Int. Cl.² A01C 11/02; A01G 9/02; B26F 3/02
U.S. Cl. 225—5 **3 Claims**

1. A method of separating seedling bodies, individually and successively, from a continuous assembly of generally cylindrical seedling bodies, each of said bodies being filled with soil and containing a seedling previously planted therein, said seedling bodies having no caps or bottoms and being made of rot-proof paper or film, said assembly of seedling bodies including a plurality of seedling bodies, each pair of adjacent seedling bodies being connected together by means of a connecting portion to form a strip of seedling bodies, said strip of seedling bodies being assembled into a row-state by folding right and left, alternately at every preselected length thereof, wherein each of said connecting portions have a separating-line therein at which it is desired to separate individual seedling bodies prior to transplanting, said separating-lines having a



separation-guide-portion provided at the upper or lower end or both ends of each separating-line, comprising:

pulling out the assembly of seedling bodies from one end thereof;

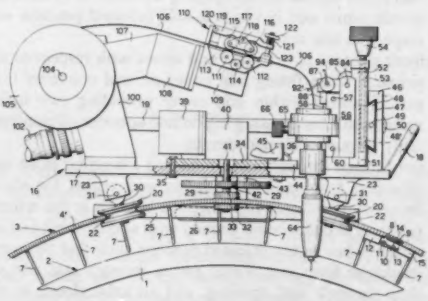
separating individual seedling bodies by applying tensile stress to the connecting portions between the previous seedling body and the succeeding seedling body initially only at the end of said separating-line in which is said separation-guide-portion and progressively moving the area of applied stress linearly along said separating-line, thereby separating the assembly into individual seedling bodies.

4,132,338

APPARATUS SUITABLE FOR USE IN THE AUTOMATIC WELDING OF PIPES

Ottavio Bove, San Donato Milanese (Milan), and Ugo Cannata, Albissola Marina (Savona), both of Italy, assignors to Saipem S.p.A. and Arcos Saldatura Elettrica Autogena S.p.A., both of, Italy

Filed Apr. 14, 1976, Ser. No. 676,806
Claims priority, application Italy, Apr. 17, 1975, 22433 A/75
Int. Cl.² B23K 37/02
U.S. Cl. 228—27 **8 Claims**



2. An automatic pipe welding apparatus comprising:

a rail band which is fixedly mounted about the pipe in a predetermined relationship with respect to the edge of the pipe to be welded, and, said rail band having at least one knurled outer side, two opposed metallic straightedges

having knurled outer sides and a C-shaped cross-section, a metallic sheet having side edges which are affixed in the grooves of the C-shaped straightedges, and, pairs of spacers mounted at a set distance from each other to the bottom of the metallic sheet and engaging the pipe at the other end, and,

a moving part which is movably coupled to the sides of the rail band comprising, a single frame portion, at least one pair of grooved sliding wheels pivotally mounted on the lower portion of the frame, and, movably coupled to each side of the rail band, driving means mounted on the frame, a knurled driving pinion coupled to the driving means and cooperating with a knurled side of said rail band for driving the moving part about the rail band with an orbital motion, a welding head supported by the moving part and capable of swinging transversely with regard to the edge to be welded, a welding rod feeding mechanism and a mechanism for adjusting the position of the welding head with respect to the edge to be welded mounted on the moving part, and,

means for quickly coupling the moving part to the rail band and means for keeping the driving pinion in positive engagement with one side of the rail band, and,

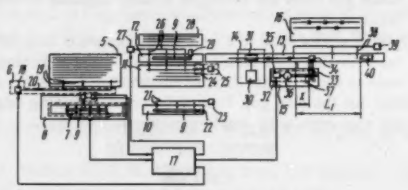
a pneumatic system coupled to the welding head to impart a swinging motion thereto and permitting adjustment of the amplitude and frequency of said motion to produce high swing frequencies and stopping of the welding head at an end of its swinging motion.

4,132,339

METHOD OF MAKING PIPE STRINGS AND AUTOMATIC LINE FOR REALIZING SAME

Vladimir Z. Gurevich, Moscow; Anatoly A. Prashin, Taganrog; Vyacheslav P. Stoyakin, Rostov-na-Donu; Sergei M. Ter-Minosian, Taganrog; Valery A. Frolov, Rostov-na-Donu; Viktor S. Tolstykh, Rostov-na-Donu; Vasily V. Bogansky, Rostov-na-Donu, and Gennady V. Ivanenko, Rostov-na-Donu, all of U.S.S.R., assignors to Vsesojuzny Proektno-Konstruktorsky Tekhnologichesky Institut Atomnogo Mashinostroenia, Rostov-na-Donu and Taganrogsky Zavod Krasny Kotelschik, Taganrog, both of, U.S.S.R.

Filed Nov. 8, 1976, Ser. No. 739,813
Int. Cl.[2] B23K *31/06*
U.S. Cl. 228—103 **3 Claims**



1. A method of making a pipe string from separate pipes of nonuniform length comprising the following operations:

preparing a first pipe string model representative of a reference pipe string and having a length corresponding to a predetermined length of a pipe string to be made;

indicating along the length of said first pipe string model zone where the location of joints is forbidden;

measuring the actual length of available pipes in a predetermined sequence;

preparing another pipe string model of an arbitrary pipe string from the measured actual lengths of the available pipes;

determining the length of said first and said another pipe string model and determining the amount by which the length of said another pipe string model exceeds the length of said first pipe string model;

marking on said another pipe string model the locations of joints of said available pipes;

comparing the location of joints marked on said another pipe string model with the location of forbidden zones indicated on said first pipe string model, all joints marked on said another pipe string model being projected onto said first pipe string model;

identifying joints marked on said another model which fall in said forbidden zones marked on said first model;

shifting said first and another models with respect to each other within the limits of the excess in length of said another pipe string model over said length of first pipe string model until a mutual arrangement of said models of pipe strings is found in which all joints marked on said another model are off the forbidden zones indicated on said first model;

shifting said first and another model with respect to each other within the limits of the difference of their lengths to identify other possible mutual arrangements of said pipe string models where all joints marked on said another model are off the forbidden zones indicated on said first model;

selecting an optimal arrangement from said possible mutual arrangements of said pipe string models which satisfies the most rational variant of use of said pipes, the selected optimal mutual arrangement of said pipe string models including a portion, equal in length to said first pipe string model, which becomes the model of the pipe string to be made;

butt welding said pipes into a string corresponding to said model of the pipe string to be made; and

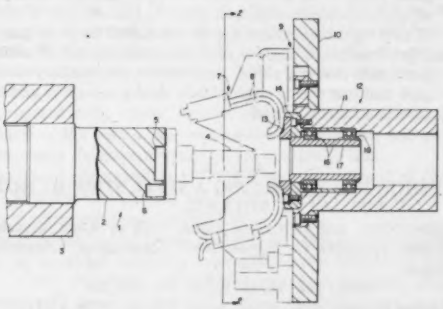
cutting off excess portions of said pipe string in accordance with said model of the pipe string to be made thereby obtaining the desired pipe string.

4,132,340

WELDING METHOD AND APPARATUS

Frederick C. Kucklick, South Bend, Ind., assignor to Manufacturing Technology, Inc., Mishawaka, Ind.

Filed Jun. 27, 1977, Ser. No. 810,170
Int. Cl.[2] B23K *19/02*
U.S. Cl. 228—113 **10 Claims**



1. The process of welding a first workpiece to at least one other workpiece comprising the steps of:

engaging one end of said first workpiece with a rotatable workpiece drive member;

supporting at least one other workpiece in a workpiece holding fixture;

providing radial support for said first workpiece at a point not on the same side of said at least one other workpiece as said workpiece drive member by inserting said first workpiece within a collet member that is mounted so as to be rotatable and axially displaceable;

and rapidly rotating said first workpiece and forcing it into engagement with said at least one other workpiece so as to

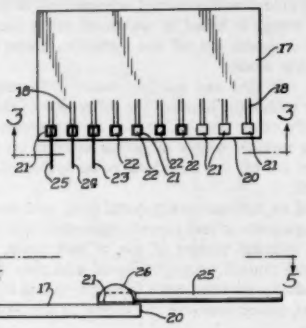
friction weld the workpieces along their common interface.

4,132,341

HYBRID CIRCUIT CONNECTOR ASSEMBLY

William R. Bratschun, LaGrange, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Jan. 31, 1977, Ser. No. 764,305
Int. Cl.[2] B23K *1/12*
U.S. Cl. 228—122 9 Claims



1. A method of attaching a plurality of relatively rigid conductive connectors to a plurality of terminal pads spaced along an edge of the substrate of a first hybrid circuit for forming a connector assembly capable of self-supporting said first hybrid circuit when received by suitably configured utilization means comprising the steps of:

depositing a predetermined amount of solder paste on each of said terminal pads thereby forming a solder paste fillet overlying each of said terminal pads;

locating one end of each of said connectors on a respective one of said solder paste fillets; and

gradually heating said substrate for reflowing said solder paste fillets to achieve a high strength non-mechanically supported solder connection between said one end of each of said rigid connectors and its associated terminal pad;

said predetermined amount comprising an amount of solder paste such that said solder connections substantially envelope said one end of each of said rigid connectors and its associated terminal pad.

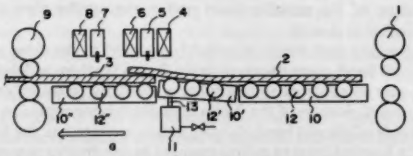
4,132,342

METHOD FOR PRODUCING A STEEL STRIP BY HOT ROLLING

Hajime Nitto, and Hiromitsu Naito, both of Kitakyusyushi, Japan, assignors to Nippon Steel Corporation, Otemachi, Japan

Filed Sep. 15, 1977, Ser. No. 833,703
Claims priority, application Japan, Sep. 18, 1976, 51-111975; May 7, 1977, 52-051743; Aug. 13, 1977, 52-96577; Aug. 13, 1977, 52-96598
Int. Cl.[2] B23K *19/00*
U.S. Cl. 228—136 20 Claims

1. In a method for producing a hot strip by hot rough rolling, a steel slab heated to a rolling temperature to obtain a steel band, and hot finishing rolling the steel band in a continuous manner, the improvements comprising overlapping a forward end portion of a steel band which is being rolled by the rough hot rolling over a finishing end portion of a similarly rolled preceding steel band before or during the hot finishing rolling step, with insertion between the overlapped portions of the both hot bands of an oxide scale-fusing agent which reacts with the oxide scale present on the opposing surfaces of the overlapped portions by the heat of the overlapped portions and forms a low-melting point substance, fixing temporarily the overlapped portions by means of a metallic nail-like member



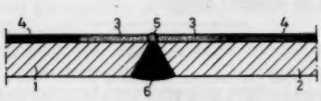
driven into the overlapped portions, bonding the overlapped portions by reduction, and subjecting the steel bands thus bonded to the hot finishing rolling continuously.

4,132,343

METHOD FOR MANUFACTURING A PIPELINE HAVING AN INTERNAL PROTECTIVE LAYER

Anders Kullendorff, Finspang, Sweden, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Mar. 1, 1977, Ser. No. 773,268
Claims priority, application Sweden, Mar. 4, 1976, 7603003
Int. Cl.[2] B23K *5/08*
U.S. Cl. 228—168 9 Claims



1. A method for manufacturing a pipeline from lengths of steel pipe welded together in end-to-end relation to be used, for example, for the transmission of wet steam, comprising the steps of:

weld-plating the internal end portions of adjoining pipe lengths with a layer of corrosion-resistant material,

applying a protective layer of a particular thickness of a material resistant to erosion and corrosion to the internal surfaces of said pipe lengths between the weld-plated layers,

providing a ring gap at the ends of adjoining pipe lengths when the ends are arranged closely adjacent to one another,

applying a root bead of substantially the same material as is used for the weld-plated layer around the adjoining pipe ends at the junction ends of the weld-plated layer, and

filling out the ring gap formed between adjoining edges of the pipe ends with welding material.

4,132,344

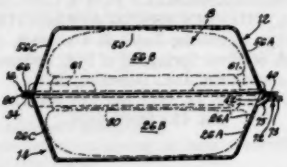
FOAM SANDWICH PACKAGE

Donald K. Jewell, Naperville, Ill., assignor to Restaurant Technology, Inc., Oak Brook, Ill.

Continuation of Ser. No. 577,998, May 16, 1975, abandoned.
This application Aug. 25, 1976, Ser. No. 717,485
The portion of the term of this patent subsequent to Jul. 6, 1993, has been disclaimed.
Int. Cl.[2] B65D *1/34, 5/66*
U.S. Cl. 229—2.5 R 2 Claims

1. A foam sandwich package comprising: a lower dish section and an upper cover section for covering said dish section, said dish section comprising a supporting floor and an upstanding peripheral side wall extending upwardly and outwardly from the floor to an upper peripheral wall edge, said floor being proportioned to support said dish section on a table surface, said cover section comprising a dome and a peripheral side wall extending downwardly and outwardly from said dome to a lower peripheral wall edge, said dome being propor-

tioned to support said cover section on a table surface, said cover section defining a depending peripheral skirt circumscribing the major portion of said lower peripheral wall edge and which skirt, when said cover section is juxtaposed with said dish section, embraces and circumscribes a major portion of said upper peripheral wall edge, a latching mechanism for said dish and cover sections comprising at least one rigid latching tongue, said tongue laterally extending from said dish section at a front portion of said dish side wall, said latching tongue projecting forwardly of said front wall portion and lying in a plane substantially parallel to the plane of a table surface when said dish section is supported on a table surface, and said latching mechanism further comprising a complementary latching aperture defined in the side wall of said cover section for each said latching tongue, each said latching aperture opening laterally of the side wall of said cover section and being positioned adjacent said lower peripheral wall edge and having a width at least as great as the width of the latching



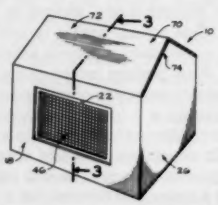
tongue, a web at the base of the latching aperture and projecting the outwardly of said cover side wall and being proportioned to underlie a latching tongue when said cover and dish sections are juxtaposed and latched, said front wall portion of said dish section including a resilient portion generally beneath said latching mechanism which when pushed inwardly allows the latching tongue to be retracted inwardly of the inner edge of the surfaces defining said latching aperture and then, when released, biases the latching tongue outwardly through the latching aperture, and wherein a said latching tongue, when said cover and dish sections are juxtaposed and latched, projects outwardly beyond the skirt and over a said web, and wherein said lower dish section maintains an outward bias against the upper cover section at the latching mechanism, thereby to help maintain the latching mechanism in a latched condition and to help prevent accidental opening of the package, and in which said latching tongue and said front wall portion merge in a reinforcing strut.

4,132,345

CONTAINER COMPRISING A FOLDED BLANK, AND BLANK THEREFOR

Paul E. Nielsen, 1341 N. Alexandria Ave., Los Angeles, Calif. 90027

Filed Jan. 6, 1978, Ser. No. 867,474
Int. Cl.² B65D *5/02*
U.S. Cl. 229—8 **15 Claims**



1. In a container comprising a folded blank, the combination of:

(a) walls comprising folded integral parts of the blank and including front and rear walls and gable-shaped end walls having triangular upper ends;

(b) gable-shaped rafters integral with and extending along the upper edges of said end walls and extending inwardly of the container from said end walls; and

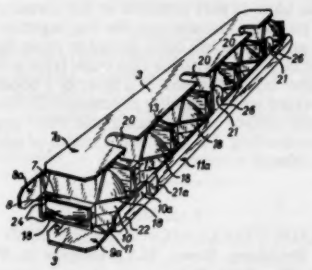
(c) each of said end walls being of double thickness and comprising inner and outer end wall panels having along their upper edges interengaged extensions forming the corresponding gable-shaped rafters and interlocked at the peaks of said gable-shaped rafters.

4,132,346

FOLDED-UP PACK FOR FRAGILE ARTICLES

Toni Casutt, Kirchweg 46, 8102 Oberengstringen, Switzerland

Filed Feb. 28, 1978, Ser. No. 882,186
Claims priority, application Switzerland, Mar. 1, 1977, 2525/77
Int. Cl.² B65D *5/48*
U.S. Cl. 229—28 R **6 Claims**



1. A pack for fragile articles, in particular eggs, comprising a plurality of parallel flat strips and an equal number of corrugated strips each fastened to a flat strip of the same width at alternate apices, said corrugated strips having flat apices and being joined integrally together side by side at alternate apices intermediate said apices attached to said flat strips, the joined-together apices being bent up on fold lines at the strip junctions running in the longitudinal direction of the strips, so that the corrugated strips enfold cavities and the flat strips form the outside of the pack while bracing the corrugations, said pack comprising the improvement which consists in that:

a central corrugated strip (**8**) is joined on each side at alternate flat apices of the strip to the corresponding apices of a wider corrugated strip (**7,9**);

each of said wider corrugated strips (**7,9**) is similarly joined to an outer narrower corrugated strip (**10,11**) of such width that said two outer narrower corrugated strips (**10,11**) have a total width approximately equal to the width of said central corrugated strip (**8**);

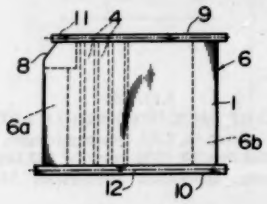
at least one (**10*a***) of the flat strips affixed to said outer narrower corrugated strips (**10,11**) has at least one tongue on its side which is closer to the nearer (**7**) of said wider corrugated strips (**7,9**) and the flat strip (**7*a***) affixed to said wider corrugated strip (**7**) which is nearer to said at least one flat strip (**10*a***) has at least one lateral cutout corresponding to said at least one tongue, said at least one tongue being longer than the width of the flat strip (**10*a***) of which it forms part, being folded over in the neighborhood of its root (**26**), and having its projecting end bonded to the other flat strip (**11*a***) affixed to the other (**11**) of said outer narrower corrugated strips for holding said pack in closed condition.

4,132,347

MOISTURE PROOF BAGS PROVIDED WITH BLOW-IN PORTS AND METHOD OF MANUFACTURING THE SAME

Akio Saito, Tokorozawa, Japan, assignor to Showa Seitai Kogyo Kaisha Ltd., Tokyo, Japan

Filed Jun. 29, 1977, Ser. No. 811,444
Claims priority, application Japan, Jul. 7, 1976, 51-89302[U]; Oct. 31, 1976, 51-115718[U]
Int. Cl.² B65D 31/14
U.S. Cl. 229—62.5 5 Claims



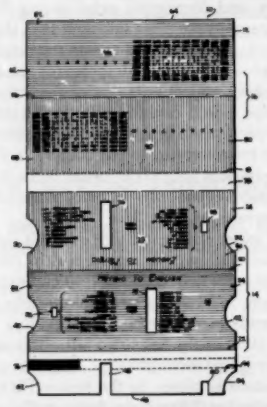
1. In a bag comprising an outer layer of synthetic resin which is impervious to air and moisture, an inner paper layer and a foldable blow-in port provided at one corner of the bag for blowing powdery material into the bag together with air, the opposite ends of the bag being sewed to close the bag, the improvement in the bag wherein said outer layer is bonded to said inner paper layer by means of a layer of a bonding agent which is provided with a plurality of substantially longitudinal grooves on the surface thereof facing said inner paper layer, said grooves extending along the entire length of said bag and constituting exhaust passages.

4,132,348

SLIDE CALCULATOR AND METHOD

Howard M. Bromberg, Bronx, N.Y., assignor to The Flexi-Group Inc., New York, N.Y.

Filed Jun. 30, 1976, Ser. No. 701,082
Int. Cl.² B65D 27/00
U.S. Cl. 229—75 21 Claims



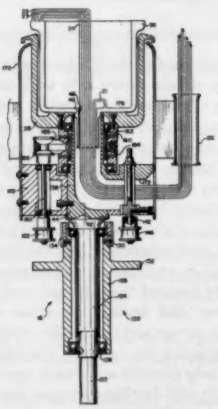
1. A construction for a slide calculator comprising a sheet having a generally rectangular periphery and including first and second leaf members, said first leaf member having at least three elongated sleeve segments formed within the confines of said generally rectangular periphery and including two substantially parallel sleeve fold lines, said first leaf member being foldable along said sleeve fold lines such that said sleeve segments may be overlapped to define a sleeve component having a cross-sectional periphery with a predetermined inside width, said second leaf member having at least two elongated slide segments formed within the confines of said rectangular periphery and including at least one slide fold line parallel to said sleeve fold lines, there being no sleeve segments or slide segments on said sheet which are external of said generally rectangular periphery, said second leaf member being foldable along said slide fold line such that said slide segments may be overlapped to define a slide component having a predetermined outside width less than the inside width of said sleeve component, a first separation line on said sheet formed substantially parallel with said sleeve fold lines and said slide fold line as a line of division between said leaf members such that said first leaf member is detachable from said second leaf member at said first separation line to permit insertion of said folded slide component in said folded sleeve component for relative movement between said components.

4,132,349

ROTOR DRIVE ASSEMBLY FOR A CENTRIFUGAL LIQUID PROCESSING APPARATUS

Mirza A. Khoja, Columbia; Louis F. Gutierrez, and John T. Perone, both of Silver Spring, all of Md., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Nov. 11, 1977, Ser. No. 850,621
Int. Cl.² B04B 9/08
U.S. Cl. 233—25 1 Claim



1. In a centrifugal liquid processing apparatus wherein a rotor assembly having a container for receiving liquid to be processed by centrifugation is rotatably mounted on a rotor drive assembly, the improvement residing in said rotor drive assembly comprising a unitary drive shaft coupled at a lower end thereof to a prime mover, a first collar rotatably journaled to a lower portion of said drive shaft above the lower end thereof, a second collar fixed to an upper portion of said drive shaft above said first collar, a third collar rotatably journaled to said upper portion of said drive shaft above said second collar, container holding means secured to the upper side of said third collar, first passage means in said upper portion of said drive shaft, second mating passage means in said container holding means, third passage means extending through said second collar from an outer side of said second collar, said first passage means mating at a lower end thereof with said third passage means, two idler pulleys rotatably mounted to parallel spaced stub shafts depending from said second collar, an idler shaft rotatably journaled in said second collar and having a driven pulley at a lower end thereof and a drive pulley at an upper end thereof, said driven pulley, said idler pulleys and said first collar forming planetary drive means driven by a first continuous drive belt engaging the same, and a second continuous drive belt engaging said drive pulley and said third collar

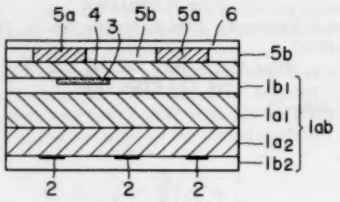
whereby said container holding means is driven at a speed which is twice the speed of said drive shaft.

4,132,350

MAGNETIC CARD

Tetsuo Kubota, Tachikawa; Atsumi Noshiro, Chiba, and Norimoto Suzuki, Tokyo, all of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 21, 1977, Ser. No. 853,273
Claims priority, application Japan, Nov. 24, 1976, 51-140926
Int. Cl.² G06K *19/06*
U.S. Cl. 235—493 **23 Claims**



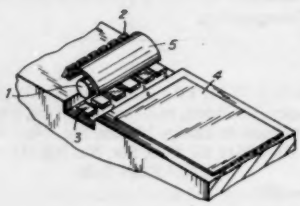
1. A magnetic card comprising:
(1) a planar substrate having at least a surface layer of a thermoplastic resin;
(2) a magnetic layer disposed at at least one part of a surface of the planar substrate;
(3) a color layer disposed on the magnetic layer; and
(4) a pattern layer disposed on the color layer.

4,132,351

REFLECTIVE OR TRANSMISSIVE OPTICAL READER

Yoshiyuki Sakurai, Shiojiri, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Nov. 15, 1976, Ser. No. 742,394
Claims priority, application Japan, Nov. 13, 1975, 50/136703
Int. Cl.² G06K *7/10*
U.S. Cl. 235—454 **6 Claims**



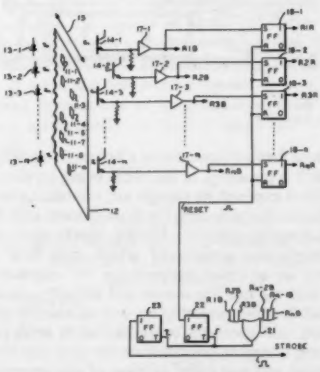
1. An information reader for reading light-transmissive or light-reflective information for an information carrying medium comprising support means for selectively disposing said medium at a reading position, transmissive light source means disposed on a first side of said reading position for directing light at said medium to be transmitted therethrough, reflective light source means disposed on the other side of said medium for directing light at said medium to be reflected therefrom, and light sensitive transducer means disposed proximate to said reading position on the same side as said reflective light source means, said light-sensitive transducer means including a photoelectric detector means adapted to detect said light transmitted through said medium when said reader is in a transmissive mode and said light reflected from said medium when said reader is in a reflective mode and in response thereto produce at least a two voltage level output signal representative of one of the absence and presence of light transmitted through the medium and the amount of light reflected from said medium, mode selection switching circuit means coupled to said reflective light source means and said transmissive light source means for alternatively and selectively energizing one of said transmissive light source to dispose said reader in a transmissive mode and said reflective light source means to dispose said reader in a reflective mode, said transducer means including first and second logic means, coupled to said switching circuit means, said first logic means and said reflective light source means being coupled in parallel to each other and in series with said switching circuit means for producing a light sensitive signal having first and second voltage levels corresponding respectively to the absence and presence of reflected light detected by said transducer means in response to said output signal when said reader is disposed in a reflective mode, said second logic means and said transmissive light source means being coupled in parallel to each other and in series with said switching circuit means for producing a light sensitive signal having a first and second voltage level respectively corresponding to the presence and absence of light detected by said transducer means in response to said output signal when said reader is disposed in a transmissive mode, and amplifier-wave shaping circuit means disposed intermediate said photoelectric detector means and said logic means for shaping and amplifying the voltage level output signal produced by said photoelectric detector means and applying same to one of said respective first and second logic means.

4,132,352

INFORMATION READER TIMING CIRCUIT

Richard A. Salberta, Titusville, N.J., assignor to Taurus Corporation, Lambertville, N.J.

Filed Apr. 26, 1977, Ser. No. 790,899
Int. Cl.² G06K *7/10, 9/04*
U.S. Cl. 235—456 **7 Claims**



1. Apparatus for providing signals indicative of information characters present on a medium being scanned in a predetermined direction, each information character is located on said medium at one of a plurality of preselected sites forming a matrix wherein the positions of the sites are defined by first lines oriented in a first direction intersected by second lines oriented in a second direction, said apparatus comprising:

detecting means for producing a plurality of first output signals, said detecting means comprising a plurality of detectors arranged in a linear array each producing one of said first output signals from information characters in a predetermined line corresponding to the orientation of said linear array, said detecting means further comprising memory means including only a single array of memory elements for storing each one of said first outputs and for indicating same,

logic means responsive to the start of the first one of said first outputs that occur before the other of said first outputs and responsive to the termination of the last of said first

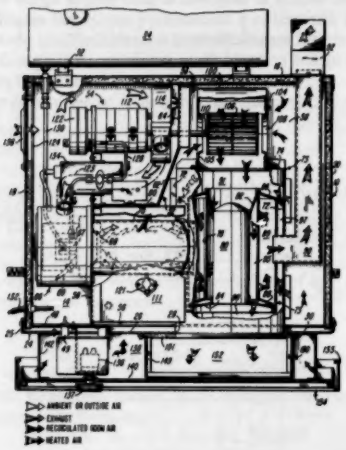
outputs for providing a second signal having a duration corresponding to the interval between the two responses, resetting means responsive to the beginning of said second signal for clearing the content of said memory means, and output means responsive to the end of said second signal providing a strobe signal to indicate that said memory means has stored therein the outputs of all detectors each responsive to one of the information characters in said predetermined line.

4,132,353

WINDOW HEATERS

Eugene C. Briggs; Robert F. Shaftner, both of Bowling Green, Ky., and Harry J. Giambrone, Dayton, Ohio, assignors to Koehring Company, Brookfield, Wis.

Filed Apr. 4, 1977, Ser. No. 784,056
Int. Cl.[2] F24H 3/10
U.S. Cl. 236—10 **28 Claims**



1. A window furnace comprising a housing assembly, a front panel of which is presented in the room being serviced and the rear of which is exposed to outside air, containing air heating means and means for inducing the flow thereto and therefrom of air, said housing assembly having apertures in the body thereof through one portion of which said flow inducing means draws air at room temperature for exposure to and heating by said air heating means and delivery therefrom to exit from said housing assembly by way of another portion of said apertures, said apertures being limited to areas peripheral to said housing assembly intermediate the said rear thereof and said front panel and said other portion of said apertures being remote from said one portion thereof, providing thereby that the heat of the air exiting from said housing assembly is essentially totally utilized to elevate the temperature of said room, said one portion of said apertures including one aperture adjacent to which, in said housing assembly, is a thermostat control unit; included in a circuit for controlling the operation of said furnace, in which the desired temperature of the room air may be set, which includes means to sense and compare the temperature of room air entering said housing assembly to the temperature set, said thermostat control unit being mounted to means providing a conductive exposure of said sensing means of said thermostat control unit to outside air temperatures whereby in the function thereof said thermostat control unit will take into consideration the temperature of outside air.

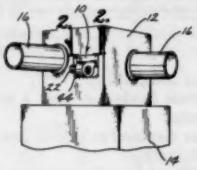
16. A window furnace comprising a housing assembly, a front panel of which is presented in the room being serviced and the rear of which is exposed to outside air, containing air heating means and means for inducing the flow thereto and therefrom of air, said housing assembly having apertures in the body thereof through one portion of which said flow inducing means draws air at room temperature for exposure to and heating by said air heating means and delivery therefrom to exit from said housing assembly by way of another portion of said apertures, said apertures being located in a recessed portion of the periphery of said body located adjacent and to the rear of said front panel of said housing assembly, and said other portion of said apertures being remote from said one portion thereof, providing thereby that the heat of the air exiting from said housing assembly is essentially totally utilized to elevate the temperature of said room.

4,132,354

AUXILIARY AIR DISPLACEMENT METHOD AND UNIT FOR FURNACES

Clarence J. Kenworthy, 2706 E. Washington St., Des Moines, Iowa 50317

Filed Aug. 5, 1977, Ser. No. 822,255
Int. Cl.[2] F23N 3/00
U.S. Cl. 236—11 **10 Claims**



1. A method of maximizing available but unused heated air located in the plenum of furnaces in order to decrease fuel costs and maintain more constant temperatures in a room air space, said method comprising:

sensing the point at which air within the plenum chamber is sufficinetly warmed to provide valuable hot air but is still below the activation temperature of the furnace blower,

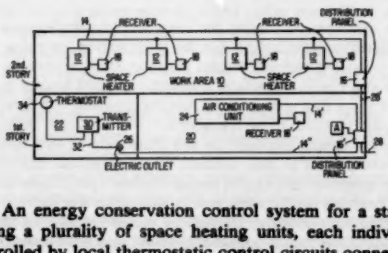
displacing said warmed air into air flow paths for said room air space, and continuing said air displacement after said furnace blower has shut down, until the air within said plenum chamber reaches a predetermined displacement shut off temperature.

4,132,355

ELECTRONIC TEMPERATURE CONTROL SYSTEM

Robert J. Cleary, Levittown, and Ronald R. Chin, Flushing, both of N.Y., assignors to Energy Master, Inc., New York, N.Y.

Filed May 18, 1977, Ser. No. 798,142
Int. Cl.[2] F23N 5/20
U.S. Cl. 236—47 **5 Claims**



1. An energy conservation control system for a structure having a plurality of space heating units, each individually controlled by local thermostatic control circuits connected to the existing electrical power distribution network in the structure, each thermostatic control circuit being operative to actuate a respective heating unit at a first selectable ambient temperature within a first range of temperatures so long as the circuit is provided with electric power from the electrical distribution network, said control system comprising:

a master control thermostat for providing a signal responsive to the occurrence of a second selectable ambient temperature within a second range of temperatures, lower than the first range of temperatures;

a timer for providing a timing signal at preselected times during at least one twenty-four hour period;

a transmitter for applying electrical pulses at at least one preselected control frequency to the electrical distribution network; and

a receiver connected to the electrical distribution network for detecting pulses at a preselected control frequency and for controlling the electric power supplied to a local thermostatic control circuit responsive to the detected pulses so that the local thermostatic control circuit receives no electrical power during a selected portion of the twenty-four hour period so long as the temperature at the master thermostat is above the second selectable temperature and so that the local thermostatic control circuit receives electrical power during the selected portion of the twenty-four hour period when the temperature at the master thermostat is below the second selectable temperature.

4,132,356

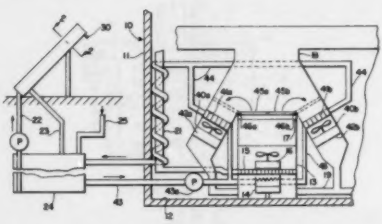
SOLAR HEATING FOR HOME USE

James L. Ramer, Rte. #1, Box 155, Sullivan, Mo. 63080

Division of Ser. No. 668,333, Mar. 19, 1976, abandoned. This application Nov. 5, 1976, Ser. No. 739,167

Int. Cl.[2] F24D 5/04

U.S. Cl. 237—1 A **5 Claims**



1. A system for providing solar heat to supplement a conventional furnace hot air building heating system comprising:

(a) solar heat collector means for heating a liquid by solar radiation,

(b) a furnace for heating air,

(c) a supply duct system connected to the furnace to receive heated air therefrom,

(d) auxiliary duct means connected to said supply duct system,

(e) heat exchange means in said auxiliary duct means,

(f) means connecting said heat exchanger means to said solar heat collector means for transfer of heat energy to said heat exchange means from said solar heat collector, and

(g) means for alternately closing communication between said auxiliary duct means and said supply duct system and leaving open the communication between said furnace and said supply duct system, and closing communication between said furnace and said supply duct system and leaving open communication between said auxiliary duct means and said supply duct system.

4,132,357

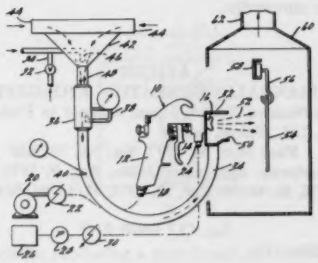
APPARATUS AND METHOD FOR SPRAY APPLICATION OF SOLVENT-THINNED COATING COMPOSITIONS

Roswell J. Blackinton, Walled Lake, Mich., assignor to Inmont Corporation, Clifton, N.J.

Filed Jun. 23, 1976, Ser. No. 698,838

Int. Cl.[2] B05B 7/16, 17/04

U.S. Cl. 239—11 **9 Claims**



1. A method for spray application of solvent-thinned coating compositions to the surface of a substrate which comprises the steps of discharging a solvent-thinned liquid coating composition through nozzle means in the form of a directionally-oriented spray comprised of a plurality of liquid droplets toward a surface to be coated, encompassing said spray in the vicinity of its origination in a shroud and substantially precluding the entrainment of ambient air in said spray, introducing a supply of secondary air at low pressure and under controlled conditions into said shroud in a manner to encompass said nozzle means and to become entrained in said spray effecting a controlled vaporization of a portion of the solvent in the liquid droplets during the course of their travel from said nozzle means to the surface in a magnitude to increase the nonvolatile content of the deposited liquid coating films to a level above the no-sag point and below the gel-point of the liquid film, and controlling at least one of temperature and humidity of said secondary air to obtain the desired magnitude of vaporization of solvent.

4,132,358

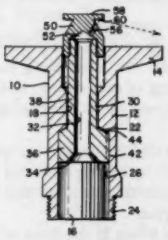
SPRINKLER NOZZLE

Robert H. Keely, 27 10th Ave. W., Kalispell, Mont. 59901

Filed Oct. 8, 1976, Ser. No. 731,027

Int. Cl.[2] B05B 15/10

U.S. Cl. 239—204 **10 Claims**



1. A pop-up sprinkler nozzle for an underground sprinkler system, comprising:

an elongated stem having an axial bore, said stem having an enlarged portion at its lower end forming an inclined seat;

a sprinkler body including a hollow, cylindrical sleeve forming a stem receiving cavity, said cavity having an enlarged portion at its lower end receiving the enlarged lower portion of said stem and forming an inclined seat adapted

to mate with the seat of said stem when said stem is in a raised position; and

a spray head fastened to the top of said stem, said head having a downwardly facing horizontal deflection plate surface, and

means defining a plurality of conduits communicating with said bore and respectively disposed at an angle relative to the axis of the bore to direct water to impinge upon the downwardly facing deflection plate surface to deflect the water outwardly.

4,132,359

MANUALLY OPERATIVE ATOMIZER

Takamitsu Nozawa, Tokyo, Japan, assignor to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Filed Mar. 30, 1977, Ser. No. 782,888

Claims priority, application Japan, Apr. 9, 1976, 51/44649; Apr. 9, 1976, 51/44650; Apr. 13, 1976, 51/45761; May 31, 1976, 51/70146

Int. Cl.² B05B 9/43

U.S. Cl. 239—333 **3 Claims**

1. In a manually operable atomizer of the type having a container for containing liquid and an atomizer assembly connected to said container for atomizing the liquid, the atomizer assembly including a cylinder, a piston slidable in said cylinder, an atomizer head having a nozzle port therein, a pipe connecting and allowing communication between said piston and said atomizer head, and a spring biasing said atomizer head in a first direction, movement of said atomizer head in a direction opposite said first direction causing compression of liquid in said cylinder, forcing the liquid through said pipe and out through said nozzle port,

the improvement comprising:

a guiding member on said atomizer head;

an operating member for depressing said guiding member against the biasing of said spring, said operating member including an inclined surface engaging said guiding member; and

a cap connected to said container for supporting said operating member, said cap having openings therein for allowing access to said operating member and to allow passage of the atomized liquid;

said guide member being in the form of a pair of guide pins projecting outwardly from respective side surfaces of said atomizer head;

said inclined surface of said operating member including corresponding inclined cam surfaces on two space arms of said operating member, said cam surfaces engaging respective ones of said guide pins;

said operating member being pivotally secured at a base portion thereof to the ceiling of said cap for free pivotal movement.

4,132,360

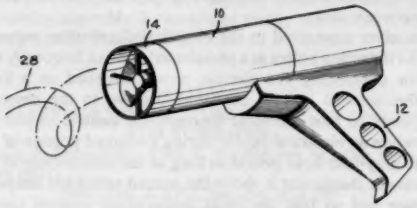
PULSATING HAIR DRYER

Lawrence J. Lee, Jr., Huntington, Conn., assignor to General Electric Company, Bridgeport, Conn.

Filed Aug. 22, 1977, Ser. No. 826,416

Int. Cl.² B05B 1/08

U.S. Cl. 239—383 **5 Claims**



1. A pulsating attachment for use with an electric hair dryer having a tubular end through which air is expelled comprising,

a coupling section,

an asymmetrical unbalanced single impeller supported in said coupling for rotation therein, and

mounting walls connecting said coupling and tubular end,

whereby the expelled air rotates said impeller creating a pulsating spiral flow of air at a constant flow rate from the coupling.

4,132,361

FLUID MIXING DEVICE

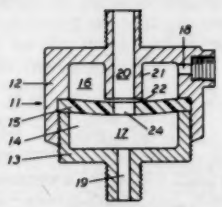
Per-Olof Ryd, Skara, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

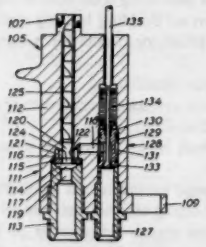
Filed May 24, 1977, Ser. No. 799,988

Claims priority, application Sweden, May 24, 1976, 7605846

Int. Cl.² B05B 7/04

U.S. Cl. 239—417.5 **10 Claims**





1. In a fluid mixing device for mixing fluids, comprising a chamber (14; 114) having separate inlets (18, 19; 118, 119) and a common outlet (20; 120) for the fluids to be mixed,

the improvement comprising:

a resilient membrane (15, 115) arranged so as to divide the

chamber (14; 114) into two compartments (16, 17; 116, 117),

the inlet (18; 118) for one of the fluids to be mixed being located in one of said two compartments (16; 116), and the inlet (19; 119) for another of the fluids to be mixed being located in the other of said two compartments (17; 117),

the outlet (20; 120) comprises a tubular portion (21; 121) which extends through one (16; 116) of said two compartments and which is formed with an annular end surface (22; 122),

said annular end surface (22; 122) being disposed substantially parallel to said membrane (15; 115),

said membrane (15; 115) being arranged to sealingly cooperate with said annular end surface (22; 122) under the action of a preload and to be separated from said surface (22; 122) at a certain pressure ratio between the fluids in said two compartments, thereby forming an annular discharge gap for the fluid in said one (16; 116) of said two compartments, and

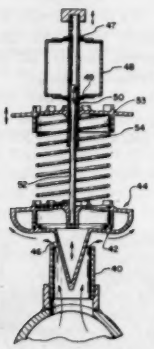
said membrane (15; 115) being formed with an opening (24; 124) through which the other (17; 117) of said two compartments continuously communicates with the outlet (20; 120).

4,132,362

SPRAY HEAD

Paul E. Hyde, and Russell N. Miller, both of Corvallis, Oreg., assignors to Neptune Microfloc, Inc., Corvallis, Oreg.

Filed Sep. 23, 1976, Ser. No. 725,780
Int. Cl.² B05B 1/26
U.S. Cl. 239—453 **13 Claims**



1. A spray head apparatus utilizing the Coanda effect comprising:

a substantially vertical liquid flow pipe having an upwardly facing outlet end; and

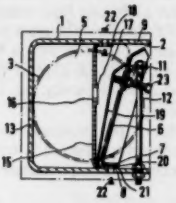
a liquid deflecting backplate positioned over said pipe having an upwardly curving, generally convex lower surface facing said outlet end, said lower surface being of sufficient size relative to said outlet end and continuously changing in slope from a negative value near the center of said surface to a slope of infinity at its outermost peripheral edge so that a flow of liquid emerging with predetermined minimum velocity from said outlet end will attach to said lower surface due to the Coanda effect and project off of said lower surface in multiple trajectories to produce a wide and substantially uniform spray pattern annulus.

4,132,363

NOZZLE FOR PRODUCING A WIDE LIQUID JET

Max Krüger, Krefeld, Fed. Rep. of Germany, assignor to Eduard Küsters, Krefeld, Fed. Rep. of Germany

Continuation of Ser. No. 650,699, Jan. 20, 1976, abandoned. This application May 5, 1977, Ser. No. 794,077
Claims priority, application Fed. Rep. of Germany, Feb. 6, 1975, 2504856
Int. Cl.² B05B 1/04, 1/32
U.S. Cl. 239—455 **9 Claims**



1. A nozzle for producing a wide liquid jet which is narrow perpendicular to its width and jet direction comprising:

(a) a U-shaped housing having a longitudinal rear wall and two longitudinal side legs of equal length extending therefrom, perpendicular thereto terminating in longitudinal edges;

(b) an elongated, essentially planar, first wall having two longitudinal edges, one of said edges rigidly attached to one of said side legs at least near its longitudinal edge, said first wall extending from said one side leg to near the longitudinal edge of the other side leg, the other longitudinal edge of said first wall cooperating with said longitudinal edge of said other side leg to form a nozzle aperture, said first wall made of a single piece of substantially firm material but having sufficient resilience to permit bending;

(c) a plurality of adjusting means distributed over the width of said housing, disposed outside the cross-section of the nozzle aperture, engaging said first wall and permitting tilting thereof about the line of attachment of the edge of said first wall to said one leg for changing the nozzle aperture;

(d) means closing off the ends of said housing to form a chamber bounded by said rear wall, side legs, means closing off and said first wall; and

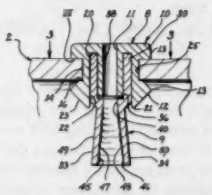
(e) an inlet opening in one of said means at one end of said housing for admitting liquid thereto.

4,132,364

CASING MOUNTED EMITTER

Richard C. Harmony, Tucson, Ariz., assignor to Harmony Emitter Company, Inc., Tucson, Ariz.

Filed Aug. 23, 1976, Ser. No. 716,441
Int. Cl.² B05B 15/02
U.S. Cl. 239—542 **12 Claims**



1. An emitter for discharging fluid from a fluid conveying conduit at a constant rate despite changes in pressure within the conduit, said emitter being penetratingly insertable within an aperture in the wall of the conduit, said emitter comprising:

a. a cap having a discharge outlet for conveying fluid from

within the conduit and through the aperture in the wall of the conduit,

b. an annular channel disposed about said cap for receivingly engaging the edge of the aperture in the wall of the conduit;

c. an annular flange disposed adjacent said channel for contactingly engaging the inner wall surface of the conduit adjacent the aperture to maintain said emitter in place,

d. an insert engageable with said cap and extending from said cap interior to the conduit for providing fluid communication from the interior of the conduit to said discharge outlet, said insert including bias means for maintaining a constant rate of fluid flow through said discharge outlet despite variations in pressure within the conduit and further including a cylindrical shroud penetratingly insertable within said annular cavity for retaining said insert affixed to said cap;

whereby, said emitter is penetratingly mountable within an aperture in the conduit to maintain a constant rate of fluid discharge from the conduit despite variations in fluid pressure within the conduit.

4,132,365

PROCESS FOR PREPARING A STABLE SLURRY OF COAL

Eke Verschuur, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 23, 1977, Ser. No. 827,194

Claims priority, application United Kingdom, Jan. 17, 1977, 1685/77

Int. Cl.² B02C *23/18*

U.S. Cl. 241—21 **7 Claims**

1. A process for preparing a stable coal/liquid slurry comprising,

(a) classifying particulate coal into more than one part on the basis of specific gravity,

(b) classifying at least the lesser specific-gravity part of the coal from step (a) into more than one part on the basis of specific gravity,

(c) classifying at least the lesser specificgravity part of the coal from step (b) into more than one part on the basis of specific gravity,

(d) grinding more than one part of the coal from step (c) into smaller particles of fineness range in reverse order of magnitude to the order of magnitude of the specific gravity of each part which is ground, in relation to each other part which is ground,

(e) grinding the greater specific gravity part of the coal from step (b) into smaller particles of fineness range less than the fineness range of any of the parts from step (d) which are ground, and

(f) combining at least some of the parts of coal from step (d), and coal from step (e), to form a slurry.

4,132,366

INFEED TUBE FOR DISC REFINERS

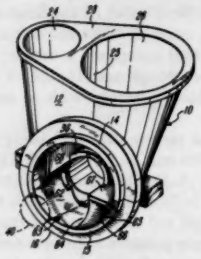
Fred Engall, Brantford, Canada, assignor to The Bauer Bros. Co., Springfield, Ohio

Filed Jun. 3, 1977, Ser. No. 803,068

Int. Cl.² B02C *7/06*

U.S. Cl. 241—245 **17 Claims**

1. An infeed structure for application to the inlet opening of a refiner including a body having two passages, each of said passages having an entrance opening and an exit opening, the entrance opening of one of said passages and the exit opening of the other of said passages being located to commonly open directly from a portion of said body constituting an adapter formed to bridge the inlet opening of the refiner to which it is applied, one of said passages being a material infeed passage and the other thereof being a steam vent passage, and separator means which in the application of said adapter to the inlet of a refiner define separate channels one of which is a material discharge channel forming part of and providing the discharge end of the material infeed passage and another of which is a steam vent channel forming part of and providing the entrance end of said steam vent passage to provide a controlled and



directed flow of the material fed through and from said material infeed passage by way of its exit opening in a path distinctly and positively separated from the entrance opening to said steam vent passage, which lies adjacent thereto.

4,132,367

CORD WINDER

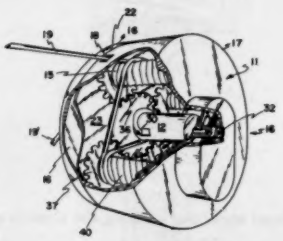
Norman Ineson, Barrie; Stuart M. Dickinson, London, and Charles E. Livingstone, Greely, all of Canada, assignors to Indicel Co., Ltd., Ontario, Canada

Filed Aug. 29, 1977, Ser. No. 828,961

Claims priority, application Canada, Jan. 4, 1977, 269059

Int. Cl.² B65H *51/08*

U.S. Cl. 242—47.1 **12 Claims**



1. A winder for storing, pay-out, and collecting cord, cable and the like, the winder comprising:

(a) a sun drum,

(b) a number of rotatable planetary drums adapted to orbit about said sun drum,

(c) a strand having one end attached to the sun drum and travelling over each of the planetary drums; and,

(d) means for causing orbiting and rotation of the planetary drums about the sun drum such that in one direction the strand migrates over the planetary drums and winds onto the sun drum, while in the other direction the strand pays out off the sun drum and travels in the opposite direction over the planetary drums.

4,132,368

DRIVE FOR A YARN FEEDER FOR A TEXTILE MACHINE

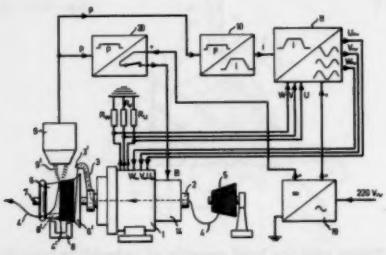
Oskar Schiess, Thalheim, and Franz Huber, Winterthur, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Oct. 26, 1977, Ser. No. 845,790

Claims priority, application Switzerland, Oct. 28, 1976, 013599/76

Int. Cl.[2] B65H *51/20*

U.S. Cl. 242—47.01 7 Claims



1. A drive for a yarn feeder for a textile machine comprising

a yarn storage device having a storage drum for receiving yarn windings thereon;

a yarn detector for sensing the presence of yarn at a preset point of said drum and for emitting a signal in response thereto,

a drive motor for activating said storage device to cause a yarn to wind onto said drum, said motor having a three phase exciting winding therein; and

a circuit arrangement for converting a direct current into a variable-frequency three-phase alternating current, said circuit arrangement being connected between said yarn detector and said drive motor for supplying said drive motor with said alternating current in response to the presence of yarn at said preset point of said drum, said circuit arrangement including

an integrator responsive to said signal of said yarn detector to produce a trapezoidal control voltage having a value corresponding to a required speed of said motor and having a growth flank and a decay flank determinative of the acceleration time and deceleration of time of said motor;

an oscillator for receiving said control voltage and emitting a control pulse sequence in response thereto, said sequence having a frequency proportional to the value of said control voltage; a digital counting circuit for receiving said control pulse sequence, said circuit having three output terminals corresponding to the three phases of said three-phase alternating current, each said output terminal being adapted to transmit of sequence of identical rectangular pulses with a 120° phase shift from the other of said outputs in consecutive order, each said sequence of rectangular pulses having a frequency of a value proportioned to said control voltage;

three inverter stages, each said stage being connected to a respective terminal of said counting circuit to receive a sequence of rectangular pulses and having two output terminals to emit alternating control pulses in phase opposition to each other in response to said receive rectangular pulses, each said control pulse having a growth flank delayed by a preset time on the decaying flank of an immediately preceding opposed control pulse; and

three switching amplifiers, each said amplifier having two input terminals for respectively receiving said control pulses to form a phase current therefrom, a choke for shaping said phase current into a sinusoidal pattern, and an output terminal for emitting said sinusoidal phase current to a respective winding of said drive motor.

4,132,369

COMPENSATING STORAGE FOR CABLE OR THE LIKE

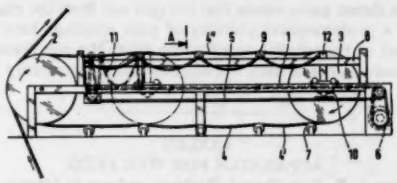
Gerhard Seibert, Butzendopplergasse 3, 1232 Vienna, Austria

Filed Mar. 31, 1978, Ser. No. 892,189

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1977, 2714839

Int. Cl.[2] B65H *75/34*

U.S. Cl. 242—47.5 7 Claims



1. A compensating storage for cable or the like adapted to be wound around groups of fixed rollers and moveable compensating rollers as a pulley rope, comprising

a frame including at least one set of horizontal rails,

a plurality of first rollers fixed on said frame,

a plurality of compensating rollers moveably mounted on said at least one set of horizontal rails,

storage tensioning means for loading said compensating rollers,

support rollers adapted to support upper strands of the cable, said support rollers being arranged between said plurality of first rollers and said plurality of compensating rollers, said support rollers being moveably mounted on said at least one set of horizontal rails, said support rollers being disposed in a path of inward movement of said compensating rollers, and thereby being pushed together by the latter, and

means comprising towing members operatively connected to said compensating rollers for pulling said support rollers apart from one another.

4,132,370

DEVICE FOR FORMING A SUPPLY BOBBIN FROM A THREAD ADVANCED FROM A YARN SUPPLY

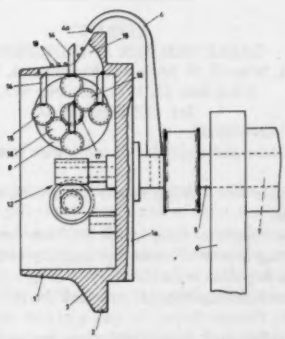
Hubert P. van Mullekom, Deurne, Netherlands, assignor to Ruti-Te Strake B.V., Deurne, Netherlands

Filed Nov. 17, 1977, Ser. No. 852,591

Claims priority, application Netherlands, Nov. 17, 1976, 7612811

Int. Cl.[2] B65H *51/20*

U.S. Cl. 242—47.12 7 Claims



1. A device for forming a supply bobbin from a thread advanced from a yarn supply comprising, in combination, a stationary winding drum having a winding space around the

drum and defining an internal chamber and a slit connecting the winding space and the chamber, rotatably mounted thread guide means for winding yarn on the winding space of the drum, a plurality of pins rotatably mounted within the chamber of the winding drum for movement in an axial plane with respect to the winding drum through the slit one after the other, the pins successively exiting and entering the chamber of the winding drum through the slit, and means for so driving the pins continuously in a fixed transmission ratio with respect to the thread guide means that the pins exit from the chamber after a predetermined plurality of yarn windings have been formed on the winding space of the drum, the pins separating successive series of yarn windings by each momentarily forming a barrier for yarn windings.

4,132,371

APPARATUS FOR WEB FEED

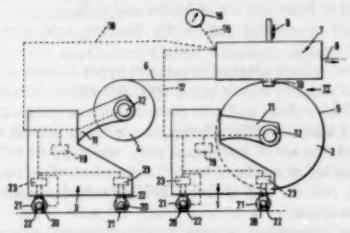
Graham A. B. Byrt, Bristol, England, assignor to Masson Scott Thrissell Engineering Ltd., London, England

Filed Dec. 16, 1977, Ser. No. 861,243

Claims priority, application United Kingdom, Dec. 21, 1976, 53347/76

Int. Cl.[2] B65H *19/14*

U.S. Cl. 242—58.3 **6 Claims**



1. Web feed apparatus comprising a first reel support, a second reel support, and a splicer operable to join a leading end of web from a reel carried by said first support to a running web feeding from a reel carried by said second support, said first support being movable to a datum position after loading of a fresh reel thereon, including a sensing device movable towards the circumferential surface of said reel at said datum position, said sensing device being adapted to respond to proximity of said reel, and means under control of said sensing device for stopping movement of the sensing device so that the sensing device stops in a position dependent upon the reel diameter.

4,132,372

CABLE HOLDER AND DISPENSER

Milton H. Worrell, N. Main St., Vincentown, N.J. 08088

Filed Feb. 13, 1978, Ser. No. 877,261

Int. Cl.[2] B65H *49/00*

U.S. Cl. 242—129.62 **10 Claims**

1. A holder and dispenser of cable wire from reels comprising:

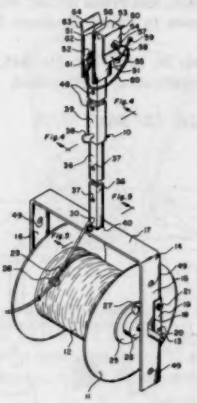
(a) a cable reel holding means comprising an axle held in a frame,

(b) a swivel means from which the frame hangs allowing the holding means to rotate horizontally in the direction the cable is pulled from the reel,

(c) a vertical strap support on which the swivel means hangs, and

(d) a rafter and joist attachment means from which the vertical strap hangs comprising a U-shape inverted in the operative position of a size sufficient to hand over the top of a rafter or a joist, and

an upright U-shape of sufficient size to slide over the bottom and sides of a joist or rafter from below with at least one hole in one of the vertical uprights of the upright U-shape and a pin



means fitting into the hold capable of imbedding into the joist or rafter.

4,132,373

MANNED SPACE FLIGHT BODY

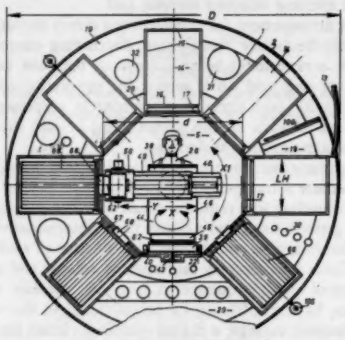
Gunther Lang, Triesterstrasse 388, Graz, Austria (A-8055)

Filed Feb. 10, 1977, Ser. No. 767,299

Claims priority, application Austria, Feb. 11, 1976, 956/76

Int. Cl.[2] B64G *1/00*

U.S. Cl. 244—159 **14 Claims**



11. A manned space flight body comprising

(a) a cylindrical shell defining an axially extending, elongated cell,

(b) a shelf construction built into the cell and including means for receiving and supporting pallets, the shelf construction having a shape resembling a hollow prism and being comprised of a plurality of individual, radially extending and axially adjacent storage rooms for life support systems, power supply systems, flight control systems, laboratory systems, production systems, and other systems used in space flight,

(c) an axially extending operating room in the free center of the cell and surrounded by the shelf construction, all the storage rooms being accessible from the central operating room and the operating room being arranged to permit movement therethrough for access to the storage rooms,

(d) a connecting plate at an end of the hollow cylindrical body for closing the cell,

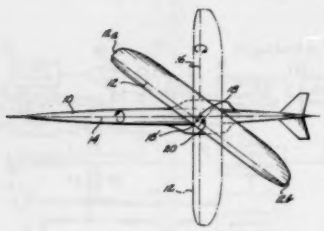
(e) a space platform mounted on the connecting plate, the platform consisting of a lower and upper platform portion,

(f) a lock leading from the connecting plate to the platform, and
(g) a track on the platform.

4,132,374
WING PIVOT LOCATION AND STRUCTURE FOR OBLIQUE WING AIRPLANE

Clarence L. Abell, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 30, 1976, Ser. No. 755,833
Int. Cl.[2] B64C 3/40
U.S. Cl. 244—46 7 Claims



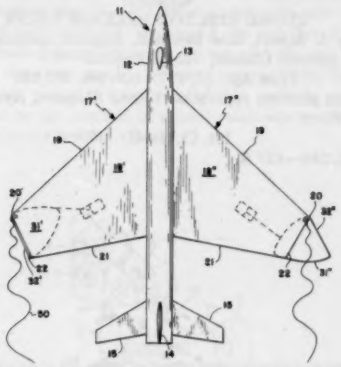
1. In an airplane having a fuselage and a single, continuous wing, said wing being swingable from a conventional position wherein the span of the wing is oriented generally orthogonally to the fuselage centerline and an oblique position wherein said wing span is oriented at an oblique angle to said fuselage centerline, said wing having a leading tip and a trailing tip when in said oblique position, said wing and said fuselage cooperating to define a mean aerodynamic center of lift when said wing is in said conventional position, the improvement comprising:
means for coupling said wing to said fuselage for swinging movement between said conventional and oblique positions about a substantially vertical axis offset rearwardly from said mean aerodynamic center of lift when said wing is in said conventional position, said vertical axis being offset rearwardly to shift said center of lift laterally relative to said fuselage in the direction of said trailing tip as said wing is swung from said conventional position to said oblique position, thereby to counteract roll moments induced by the aeroelastic effect on said oblique wing.

4,132,375
VORTEX-LIFT ROLL-CONTROL DEVICE

John E. Lamar, Newport News, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation of Ser. No. 651,002, Jan. 21, 1976, abandoned. This application Mar. 21, 1977, Ser. No. 779,429
Int. Cl.[2] B64C 3/38, 5/08
U.S. Cl. 244—90 R 6 Claims

1. A roll control for an aircraft having a swept cropped planform capable of subsonic, transonic and supersonic flight comprising:
a fuselage;
a wing having a highly swept cropped planform connected to each side of said fuselage;
each said wing including a main wing panel having a leading edge, a trailing edge and a tip section extending from the tip of the leading edge inwardly and rearwardly with respect to the longitudinal plane of symmetry of said aircraft;
each said wing further including a tip control panel pivotably connected to said tip section and having a tip edge which defines the outboard edge of said wing;
means for independently moving each said tip control panel from a first position where said tip edge is substantially parallel to said longitudinal plane of symmetry to a retracted position extending inwardly and rearwardly toward said plane whereby said tip edge thereof controls

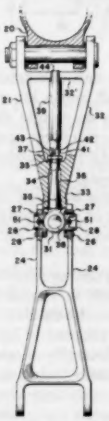


the intensity of the leading edge and side edge vortex lift generated by the shed vortex system resulting from separated flow and subsequent flow reattachment in the region of said tip edge.

4,132,376
AIRCRAFT LANDING GEAR TORQUE SCISSORS WITH UNIVERSAL JOINT AND QUICK DISCONNECT

Wilbert Sharples, Marietta, Ga., assignor to Lockheed Corporation, Burbank, Calif.

Filed Sep. 12, 1977, Ser. No. 832,223
Int. Cl.[2] B64C 25/20
U.S. Cl. 244—104 R 5 Claims



1. A torque scissors for the telescoping units of a landing gear strut of aircraft comprising a pair of links, each link terminating at one end in a mount for pivotal connection to a different one of said telescoping units, one of said links terminating at its other end in a sphere modified to include a pair of diametrically opposed flat surfaces and the other of said links terminating at its other end in a pair of spaced arcuate surfaces to receive said sphere and to thereby permit the interengagement of said links for substantially universal movement, and a lever pivotally connected to and projecting from said sphere for the movement thereof relative to both said links whereby said flat sphere surfaces are disposed adjacent said spaced arcuate sur-

faces and the sphere is out of the interengaging position to thereby permit the separation of said links.

4,132,377

STORE EJECTOR RELEASE UNITS

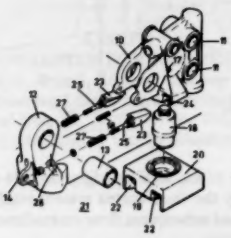
Murray A. Schorr, Bow Brickhill, England, assignor to Westland Aircraft Limited, Yeovil, England

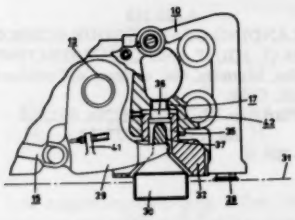
Filed Apr. 22, 1977, Ser. No. 789,841

Claims priority, application United Kingdom, Apr. 30, 1976, 17844/76

Int. Cl.[2] B64D *1/02*

U.S. Cl. 244—137 R 9 Claims





1. An ejector release unit comprising a basic assembly for attachment to an aircraft and a kit of parts for selective use with the basic assembly to enable the unit to be converted between crutched and crutchless configurations for the carriage of bale lug and saddle lug supported stores respectively, said kit of parts comprising,

removable pivot sleeves adjacent each end of the unit,

first and second pairs of interchangeable hooks adapted for selective pivotal mounting on said removable pivot sleeves,

said first pair of hooks comprising double pronged hooks for selective engagement in supporting slots in saddle lugs attached to a store to be carried,

two pairs of wedges adapted to be slidably mounted in inclined slots spaced laterally of said hooks in said unit so as to contact an upwardly facing surface of said saddle lugs thereby providing crutchless sway bracing of said store,

said second pair of hooks comprising single pronged hooks for selective engagement in a supporting slot in bale lugs attached to a store to be carried,

two crutch arm adaptors arranged for selective fitment one at each end of the unit, each adaptor including laterally extending arms,

a jacking screw on each of said laterally extending arms, each jacking screw having a pivoted reaction pad for operative engagement with an external surface of said bale lug supported store, thereby providing for crutched sway bracing of said bale lug supported store,

two spigots adapted for selective fitment to the unit so as to protrude downwardly therefrom for engagement in recesses provided in the saddle lugs, said spigots and said crutch arm adaptors being arranged for selective fitment, to the unit at common threaded holes provided in the unit, said spigots having a threaded portion for engagement in the threaded holes and,

bolts to be screwed into said threaded holes for screwing on said crutch arm adaptors.

4,132,378

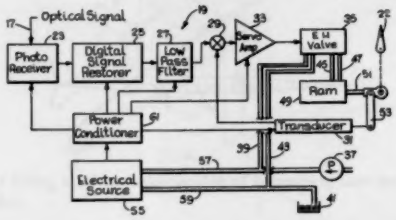
CONTROL SYSTEM FOR AIRCRAFT

Curtis E. Stevens, Irvine, Calif., assignor to Bertea Corporation, Irvine, Calif.

Filed Nov. 6, 1974, Ser. No. 521,275

Int. Cl.[2] G05D *1/00*

U.S. Cl. 244—175 11 Claims



1. A control system for positioning a control surface of an aircraft comprising:

means at a first station on the aircraft for providing a wireless control signal;

wireless transmission means for transmitting the control signal to a second station on the aircraft;

means at the second station for processing the control signal to provide a processed electrical control signal;

electrohydraulic valve means at the second station for providing a fluid output related to the processed electrical control signal;

means responsive to the fluid output of the electrohydraulic valve means for providing a mechanical output, said mechanical output being usable to position the control surface;

said processing means utilizing electric power;

a motor at the second station deriving power from hydraulic power;

an electric generator at the second station driven by the motor for producing electric power; and

means for transmitting electric power from the electric generator to said processing means.

4,132,379

METHOD FOR IMPROVING THE STOPPING ACCURACY AT RAILWAY STATIONS OF TRACK-BOUND VEHICLES

Jörg Schwarzwalder, Stuttgart, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 26, 1977, Ser. No. 845,704

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1976, 2648943

Int. Cl.[2] B61L *3/12*

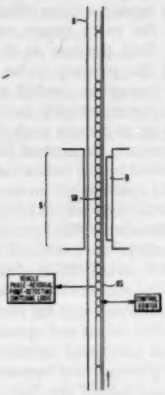
U.S. Cl. 246—167 R 2 Claims

1. In a method for improving the stopping accuracy at railway stations of track-bound vehicles to which a fixed control center transmits data telegrams over continuous track conductors and in which said vehicles determine their location by counting phase reversal points of said continuous track conductors, said phase reversal points being counted only within a window formed by activating a phase-reversal-point-detecting switching logic in the immediate vicinity of said phase reversal points, the improvement comprising the steps of:

spacing a plurality of said phase reversal points in an area of said stations at much shorter and substantially equal inter-

vals than those of said phase reversal points remote from said area of said stations, and

during the approach of a vehicle to a station stop, transmitting to said vehicle a special message giving the exact



location of a stopping point between two adjacent ones of said phase reversal points in said area of said stations, said message causing said switching logic to be permanently switched "on".

4,132,380

CLIP MECHANISM AND WALL RETENTION DEVICE FOR CUP DISPENSING HOUSING OR SIMILAR ARTICLE

Ronald Pastore, Bedford, N.Y., assignor to Cal Pak Industries, Inc., Stanford, Conn.

Filed Dec. 1, 1977, Ser. No. 856,215
Int. Cl.[2] F16M *13/00*
U.S. Cl. 248—224.1 **10 Claims**

1. A bracket and dispenser clip apparatus for slideably and removeably mounting a cup dispenser housing or similar article to a wall, comprising:

(a) a flexible, plastic wall bracket having a relatively planar back surface, first and second side walls extending from said planar surface at a given angle and sloping inwardly towards each other in the same plane, the distance between said side walls forming a slot with said back surface with said side walls being closer together at a bottom end of said back planar surface and further apart at a top end, and a bottom wall adjacent said bottom end of said back surface and overlying the bottom-edges of said first and second side walls,

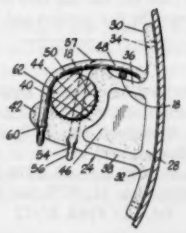
(b) a dispenser clip comprising a back arcuate section positioned on a cup dispenser housing, said back section having depending therefrom at a right and left side, two outwardly sloping side walls each directed from a top to a bottom end of said clip at a predetermined angle whereby said first and second side walls are further apart at said top end and closest together at said bottom end, said clip dimensioned so that said side walls can be slideably inserted between said side walls of said wall bracket with said bottom end of said clip coacting with said bottom wall of said bracket to retain said clip and therefore said associated dispenser housing therein, said clip and bracket when coacting, capable of being removed one from another via said slot between said side walls in said wall bracket by the exertion of a force relatively transverse to said clip and bracket.

4,132,381

RELEASABLE CLAMP FOR ELONGATED OBJECTS SUCH AS FISHING RODS

Bingham A. McClellan, Traverse City, Mich., assignor to McClellan Industries, Inc., Traverse City, Mich.

Filed Oct. 6, 1977, Ser. No. 839,773
Int. Cl.[2] A47F *5/00*
U.S. Cl. 248—316 R **4 Claims**



1. A rod holding clamp having a flat base adapted to be secured to a supporting surface, said clamp comprising:

upper and lower arms projecting outwardly from said base in spaced relation to each other and to the ends of the base,

an upwardly and outwardly concave hook having transverse serrations on its face and connecting the outer ends of said arms with a web connecting the opposed interior surfaces of said base, said arms, and said hook,

said base, said arms, said hook and said web being integrally molded of bendable but self supporting material,

and a strap of less cross sectional area than said base (connected) molded integrally at one end to said base above said arms and having divergent fingers of circular cross section at its outer end connected by a cross piece with a finger grip on the opposite side of the cross piece from said fingers,

the outer end of said hook having a tapering nose adapted to penetrate between said fingers,

the bottom of said hook below said nose defining two downwardly opening notches adapted to retainingly receive said cross piece on said strap,

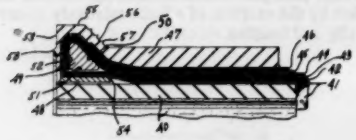
the length of said strap and said fingers being such that the strap and fingers must be stretched to move said cross piece over the nose on said hook and into said notches,

the interior length of said cross piece being less than the width of the lower portion of said hook in its unstressed condition whereby said fingers on said strap are stretched apart in moving said cross piece over said nose and into said notches.

4,132,382
PINCH VALVE SLEEVE CONSTRUCTION

Lawrence D. A. Jackson, 5235 Henri Bourassa, Montreal, Quebec, Canada (H4R 1B8)

Filed Dec. 29, 1976, Ser. No. 755,576
Claims priority, application Canada, Jan. 11, 1976, 264773
Int. Cl.² F16K 7/07
U.S. Cl. 251—5 6 Claims

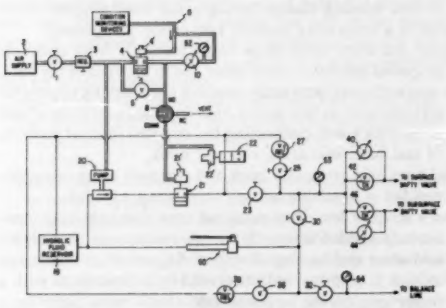


1. An open ended sleeve for a pinch valve comprising a resilient tubular body member including an elastomeric liner forming a smooth tubular inner wall, a plurality of circumferential fabric layers surrounding the liner and bonded thereto extending along the length of the body member, a gum layer surrounding the fabric layer and bonded thereto, a mounting flange at each end of the body member, a rigid annular ring in each mounting flange, each rigid annular ring comprising a first section and a second section, the first section of the ring being cylindrical in shape and adjacent to the liner, the second section of the ring positioned outside the first section and being triangular in cross section, fabric layers extending around and bonded to the outer face and the end face of the second section and extending between the first section and the second section.

4,132,383
SAFETY VALVE CONTROL SYSTEM FOR PRODUCTION WELL

Edward R. Clinton, Anchorage, Ak., assignor to Dowland-Bach Corporation, Anchorage, Ak.

Division of Ser. No. 682,040, Apr. 30, 1976, Pat. No. 4,062,379. This application Nov. 11, 1977, Ser. No. 850,817
Int. Cl.² F16K 31/12
U.S. Cl. 251—29 1 Claim

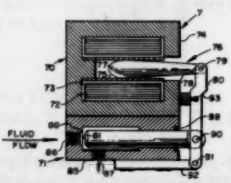


1. In a safety system for closing a primary valve disposed in the flow path of a primary fluid, in response to an indication of an undesirable condition from a monitoring device, the opening and closing of the primary valve being controlled by the pressure of an operating fluid supplied thereto the system being composed of input means arranged to be connected to the monitoring device to receive therefrom an indication of the condition being monitored, output means arranged to supply operating fluid to the primary valve, valve means connected with the output means for controlling the pressure of the operating fluid at the output means, and fluid-responsive operator means having an input operatively associated with the input means for receiving a control fluid, the operator means being connected to the valve means for switching the valve means between a state which causes the pressure at the output to effectuate opening of the primary valve and a state which causes the pressure at the output to effectuate closing of the primary valve, the pressure of the control fluid at the operator means when an indication of an undesirable condition is present at the input means having a value which causes the operator means to switch the valve means into the state which causes the operating fluid pressure at the output means to effectuate closing of the primary valve, the improvement wherein: said system comprises conduit means connected to establish direct fluid communication between said operator means input and said input means, such that control fluid is present at said input means; the control fluid pressure at said input means is determined by the indication received from the monitoring device; said operator means are arranged to switch said valve means into the state which results in closing of the primary valve when the control fluid pressure at said operator means input corresponds to the control fluid pressure created at said input means when an indication of an undesirable condition is received from the monitoring device; said system further comprises a control fluid input for receiving control fluid under pressure; said valve means and operator means comprise a first valve having an associated operator and presenting a normally closed fluid passage, said operator being connected to said input means, one side of the fluid passage defined by said first valve being connected to said control fluid input, and the other side of said fluid passage being connected in said system for causing the pressure at said output means to effectuate closing of the primary valve when the fluid passage presented by said first valve is closed and opening of the primary valve when the fluid passage presented by said first valve is open; and said system further comprises an adjustable metering valve having one side connected to said other side of said fluid passage of said first valve and having its other side connected to said operator of said first valve.

4,132,384
AUXILIARY POWER SYSTEM AND APPARATUS

John W. Berg, Space #35, 1111 Morse Ave., Sunnyvale, Calif. 94086

Division of Ser. No. 630,415, Nov. 10, 1975, Pat. No. 4,031,705, which is a continuation-in-part of Ser. No. 524,262, Nov. 15, 1974, abandoned. This application Dec. 13, 1976, Ser. No. 749,818
Int. Cl.² F16K 31/10
U.S. Cl. 251—129 2 Claims



1. A solenoid valve for fluid flow control, comprising:
a solenoid having
a field coil including a wire winding surrounding a non-magnetic bearing sleeve defining a hollow core open at its outer end, a magnetic metal housing surrounding the winding, and a flat magnetic metal surface adjacent the inner end of the hollow core, perpendicular to the axis of the hollow core;
an armature movable within said core in response to current in said field coil, said armature comprising a body member including a first generally hemispherical portion providing an enlarged end and a second conical portion extending therefrom and leading to a small end, said armature being oriented with the large end within the field coil and the small end extending outside the

field coil such that the flow of current through the field coil tends to draw the armature farther in large end first;

said armature shape and orientation providing a power output that is substantially constant relative to armature position, so that power output is a substantially linear function of said current through substantially the entire stroke of the armature;

a valve body having a valve seat;

a valve member movably located in said valve body; and

valve control means connecting said valve member to said armature for moving said valve member to and from said valve seat to control fluid flow therethrough.

4,132,385

CAM-LOCK WATER GATE

Rodney P. DeRouen, and Timothy Smith, both of Eunice, La., assignors to Coastal Culvert & Supply, Inc., Eunice, La.

Filed Feb. 23, 1977, Ser. No. 771,367
Int. Cl.[2] F16K *3/18, 39/04*
U.S. Cl. 251—147 **8 Claims**

1. A water gate structure for the control of water flow, comprising:

a frame having an opening therein adapted for flow of water therethrough;

plate means mounted adjustably on the frame for controlling the flow of water through the opening;

actuating means carried by the frame and connecting to the plate means for adjusting the position of the plate means relative to the opening;

a lock bar movable relative to the frame and spaced from the plate means;

cam means disposed between the plate means and the lock bar, the cam means being actuable to contact facing portions of the lock bar, the lock bar acting in spring-like fashion to exert a force through the cam means against the plate means to lock the plate means in a given position relative to the opening;

mounting means joined to the plate means for mounting the lock bar for movement with the plate means relative to the frame and for mounting the actuating means, the mounting means transmitting force to the plate means from the lock bar through the actuating means and cam means connected to said actuating means;

wherein the cam means includes a cam member affixed to the control rod, and said control rod is mounted vertically with the cam member adjacent the lock bar for wedging action thereof when the control rod is actuated to a locking position; and

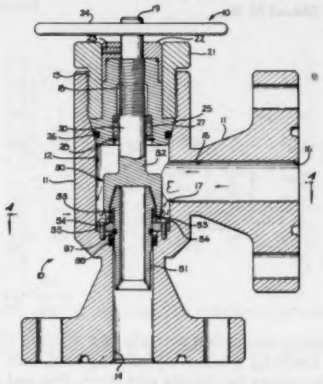
wherein the control rod is provided with screw threads thereon, and an adjusting nut is mounted on the frame for lifting and lowering said threaded control rod when said adjusting nut is rotated in one direction or the other.

4,132,386

VALVE MECHANISM FOR A CONTROL VALVE

Eugene O. Lee, 6611 Sea Side Walk, Long Beach, Calif. 90802

Filed Aug. 22, 1977, Ser. No. 826,862
Int. Cl.[2] F16K *1/44*
U.S. Cl. 251—171 **2 Claims**



1. An improved valve mechanism for controlling the flow in a conduit to be used in combination with an adjustable valve which includes:

a. a valve body having a first bore with a first open end and a second open end extending therethrough, the valve also having a second bore with a first open end and a second open end adjacent to and perpendicular to the first bore, the second bore has its transverse axis axially aligned with the radius of the first bore, the first open end of the second bore functions as an inlet and is mechanically coupled to the conduit and the second open end of the first bore functions as an outlet and is mechanically coupled to the conduit;

b. a stem having an inner end and an axially outer end which extends through the first open end of the first bore; and

c. a device forming a seal between the first open end of the first bore and the stem, said improved valve mechanism comprising:

a. a cylindrical sealing member having a bore axially aligned with the first bore of the valve body, said cylindrical sealing member being slideably engaged within the first bore of the valve body adjacent to the second open end thereof, said cylindrical sealing member having a cylindrical inner sidewall and a truncated-conical outer sidewall adjacent to its top portion and a cylindrical outer sidewall adjacent to its bottom portion;

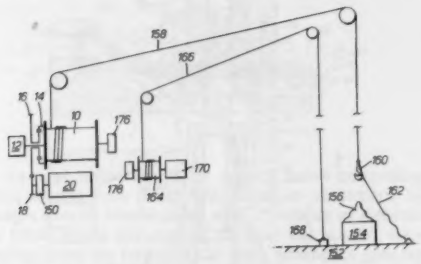
b. a cylindrical valve member which is adapted to slideably engage around said outer cylindrical sidewall of said sealing member, which is mechanically coupled to the stem so that its inner sidewall may travel adjacent to and along said outer sidewall of said sealing member, whereby the flow travels between said truncated-conical outer sidewall of said cylindrical sealing member and said inner sidewall of said cylindrical valve member in order that the flow may impinge upon itself; and

c. sealing means for forming a seal between said sealing member and the first bore of the valve body, wherein said sealing means is a compressible and resilient member which is mechanically pressed against the inner sidewall of the first bore of the valve body when said cylindrical valve member presses down against the top of said cylindrical sealing member in order to mechanically set said sealing means thereby providing a tight seal.

4,132,387
WINDING MECHANISM

William M. Somerville, Newcastle upon Tyne, and Edward D. Watson, Gateshead upon Tyne, both of England, assignors to Clarke Chapman Limited, Tyne and Wear, England

Filed Feb. 16, 1977, Ser. No. 768,987
Int. Cl.² B66D 1/48
U.S. Cl. 254—173 R 6 Claims

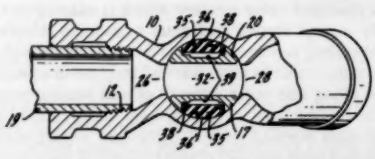


1. Winding mechanism comprising a winding drum for raising and lowering a relatively moving load, first and second reversible motors for driving said drum, first and second control means selectively operable to determine the sense of driving rotation of said first and second reversible motors, respectively, an over-run device comprising first and second parts capable of relative rotation in only one relative sense, said drum and said first motor being connected in driving relationship to said first part of said device, said second motor being connected in driving relationship to said second part of said device, said drum receiving drive from said first motor at first speeds higher than second speeds at which said drum receives drive from said second motor, said second motor having associated means which is operable selectively by said second control means to eliminate at least a major proportion of turning resistance imposed by said second motor on said drum during idle motion of said drum, and said first motor being operable to maintain said over-run device in condition to connect said drum rotationally to said second motor during lowering of said load whereby said second motor dominates the lowering speed of said load.

4,132,388
ANGLE COCK

Henry R. Billeter, Marco Island, Fla., assignor to Sloan Valve Company, Franklin Park, Ill.

Filed Jul. 15, 1977, Ser. No. 815,995
Int. Cl.² F16K 25/00
U.S. Cl. 251—175 4 Claims



1. In an angle cock, a body having an air inlet and an air outlet, and a flow passage through said body connecting said inlet and outlet,

a valve chamber in said body, a rotatable valve plug in said valve chamber for opening and closing said passage, said valve plug having a passage therein in alignment with said body passage in the open position of said plug, said valve plug having a neck portion,

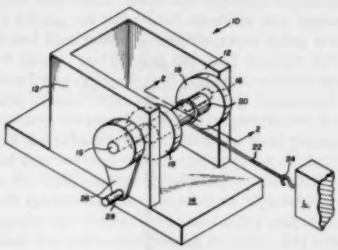
a pair of recesses formed on opposite sides of said valve plug, a sealing member fitted in each of said recesses and inwardly and outwardly slidable therein, and an arcuate shaped outer face on each sealing member.

said plug having a channel extending along the entire length of the inward surface of each recess and continuing into said neck portion of said valve plug, to provide an air space behind said sealing member whereby when said plug is rotated to the closed position air passing into said channels and said recess on the outlet side of said passage forces a sealing member from its resting position in said recess into engagement with the chamber walls to close said valve passage.

4,132,389
SELF-LOCKING WINDLASS

James S. Panzarella, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Feb. 10, 1978, Ser. No. 876,740
Int. Cl.² B66D 1/00
U.S. Cl. 254—186 HC 4 Claims



1. A self-locking windlass for preventing unwinding of the windlass under load comprising:

a shaft having an axis;

an eccentric spindle coupled to and rotatable with said shaft;

a cable having one end secured to said spindle and its opposite end securable to a load; and

means for imparting rotation to said spindle and shaft causing said cable to be wound on said spindle for pulling said load toward the windlass, and whereby during each revolution of said spindle and shaft a locking position is attained in which the force of the load due to any cause can not unwind said cable from the windlass when the rotation imparting means is released, said locking position being attained when said eccentric spindle is substantially between said shaft and load and the load force is directed along a line that is substantially tangent to the spindle and passes through said axis.

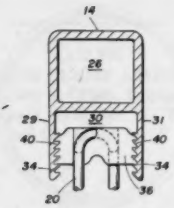
4,132,390
GATE AND PANEL SYSTEM

Walter L. Pfarr, Jr., Towson, Md., assignor to Anchor Post Products, Inc., Baltimore, Md.

Filed Jul. 15, 1977, Ser. No. 798,775
Int. Cl.² E04H 17/14
U.S. Cl. 256—24 10 Claims

1. A panel structure for use with fences, comprising, a framework of substantially rectangular configuration, said framework having two spaced side frame members and two spaced top and bottom frame members coupled together at their respective ends and all lying in a common plane, each said frame member having two substantially parallel spaced extensions extending inwardly and longitudinally thereof, a plurality of grip elements formed on the inner surfaces of said extensions, and spaced clip means having a corresponding plurality of grip elements formed in the surface thereof for engagement between the respective grip elements of said parallel spaced extensions, material means having spaced edge members posi-

tioned in said plane of said framework, said spaced edge members engaging and being held by the respective spaced clip



means for holding said material means in a taut position in the plane of said framework of said panel.

4,132,391

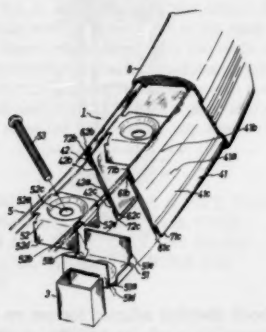
MEANS FOR FORMING A STRUCTURE OF AN OPTIONAL CURVE

Senzo Takenaga, c/o Akebono Kikai Kabushiki Kaisha, Taura Minato-Machi, Yokosuka-shi, Kanagawa-ken, Japan

Filed Dec. 21, 1977, Ser. No. 863,142

Int. Cl.² E04B *17/14*

U.S. Cl. 256—59 **7 Claims**



1. Means for forming a structure of an optional curve, comprising a pair of rails of band plate to be provided with a parallel space, and a plurality of binding fittings mounted to a longitudinal direction between a pair of rails and restricting the curvature of a pair of rails, each binding fittings having an upper binding member and a lower binding member each of which has two guiding paths at the side end thereof and has the same shape, and having a clamping bolt for clamping said two binding members, said guiding paths of said binding member being engaged with the upper and lower ends of said two rails or with inner projections to be provided adjacent said upper and lower ends, each binding fittings being able to be clamped by said clamping bolt, whereby when mounting said two binding members between said two rails, the angle of each side portion of said binding member in relation to the normal line forming the right angle toward a longitudinal direction of said rails is set to be equivalent to the ascending angle of said structure of an optional curve.

4,132,392

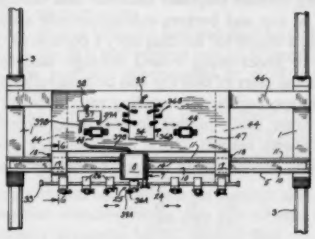
METAL CUTTING MACHINE WITH MOVABLE TORCH FEEDING SYSTEM

Harry Hooper, Brookfield, Wis., assignor to C-R-O, Inc., Menomonee Falls, Wis.

Filed Jul. 27, 1977, Ser. No. 819,359

Int. Cl.² B23K *7/10*

U.S. Cl. 266—69 **1 Claim**



1. In a metal cutting machine, the combination comprising:
(a) a transverse bridge,
(b) a master cutting torch assembly suspended from said bridge,
(c) drive means to selectively move said assembly along said bridge between the ends thereof,
(d) a torch bar disposed to one side of and extending parallel to said bridge,
(e) stop means on at least one end of said torch bar,
(f) a plurality of slave cutting torch assemblies suspended from said torch bar and normally freely movable therealong,
(g) driven movement of said master torch assembly causing the latter to push said slave torch assemblies ahead of it and into engagement with said stop means,
(h) support means mounting said torch bar for normally free movement along said bridge independent of said master torch assembly,
(i) service cable means connected to the cutting torch of each said assembly,
(j) festoon means for overhead support of said cable means and with said festoon means including a framework,
(k) means responsive to movement of said torch bar along said bridge to cause said festoon framework to move in unison with said torch bar,
(l) said master torch assembly drive means comprising means to move said festoon framework in unison with said master torch assembly, said slave torch assemblies, said torch bar and said support means after said stop means has been engaged.

4,132,393

APPARATUS FOR COOLING HOT STEEL PLATE AND SHEET

Shoji Nakamura; Yasuyuki Nakamoto; Youshun Yamamoto; Akira Matsufuji; Takashi Haji, all of Kitakyushu, and Akihiro Nakama, Ooita, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jun. 27, 1977, Ser. No. 810,475

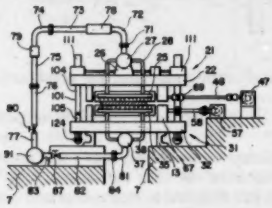
Claims priority, application Japan, Jun. 30, 1976, 51-77162; Aug. 31, 1976, 51-104087

Int. Cl.² L21D *9/00*

U.S. Cl. 266—117 **6 Claims**

1. Apparatus for cooling hot steel plate and sheet, which comprises:
a base provided in line with a plate and sheet rolling mill and extending along the delivery line of the plate;
a plurality of cooling units detachably mounted on said base in the direction of the delivery line, each cooling unit having a top roll-and-nozzle assembly, a bottom roll-and-nozzle assembly, and a plurality of coupling devices for

coupling said assemblies, said top roll-and-nozzle assembly having a top roll frame, a plurality of top rolls rotatably mounted on said frame and extending across the plate delivery line and a plurality of top cooling nozzles disposed between said top rolls, said bottom roll-and-nozzle assembly having a bottom roll frame, a plurality of bottom rolls rotatably mounted on said frame and extending across the plate delivery line and a plurality of bottom cooling nozzles disposed between said bottom rolls, said units of top and bottom roll-and-nozzle assemblies each having a length for holding only a portion of the length of plate or sheet being passed through said apparatus between the pairs of said top and bottom rolls, and each pair of said top and bottom cooling nozzles being opposed to each other, said coupling devices being disposed symmetrically with respect to the plate delivery line, and each coupling device being connected between said top and



bottom roll frames and having a first and second coupling rod portion detachably connected to each other, rod moving means connected to said first coupling rod portion for raising and lowering the roll-and-nozzle assembly to which it is connected, and restriction balance adjusting means connected to said second coupling rod portion for imparting upward and downward force to said individual coupling devices to raise and lower said top rolls in accordance with a change in the shape of the plate or sheet being passed between said top and bottom rolls for causing said top roll-and-nozzle assembly to apply substantially uniform restraining force to the surface of the plate or sheet that is contacted by the top rolls;

drive means connected to said top and bottom rolls for rotating said rolls; and

means connected to said cooling nozzles for supplying a coolant under pressure to said cooling nozzles.

4,132,394

FURNACES

Keith Johnson, and Frank Hipkin, both of West Midlands, England, assignors to Ace Furnaces Limited, Cheshire, England

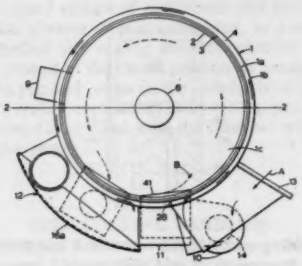
Filed Jun. 9, 1977, Ser. No. 805,237

Claims priority, application United Kingdom, Jun. 9, 1976, 23876/76; Jun. 9, 1976, 23877/76

Int. Cl.[2] F27B *14/00, 14/14*

U.S. Cl. 266—138 **6 Claims**

1. A fuel fired furnace comprising a jacket having an inner refractory lining and a layer insulative material between said lining and said jacket, said lining defining a combustion chamber, a burner firing in said combustion chamber, heat exchange means in communication with said combustion chamber through an outlet for waste products of combustion, inner and outer relatively spaced wall portions of said jacket defining an air chamber disposed externally of said lining and said insulative material and in communicaton with said heat exchange means, said heat exchange means and said air chamber consti-



tuting pre-heat means in communication with said burner to deliver pre-heated combustion air to said burner.

4,132,395

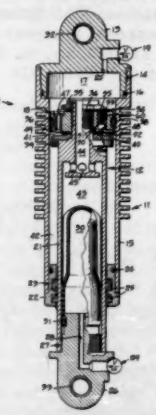
SHOCK ABSORBER WITH IMPROVED EXTENSION DAMPING

Robert C. Fox, Jr., 555 Middlefield Rd. - #N303, Mountain View, Calif. 94040

Filed Nov. 17, 1977, Ser. No. 852,468

Int. Cl.[2] F16F *9/08*

U.S. Cl. 267—64 R **11 Claims**



1. In a shock absorber adapted for use on motorcycles and the like comprising a tubular housing, a piston reciprocally mounted in said housing and having a ring mounted on a head thereof to define first and second chambers between said head and said housing on either side of said head retaining oil therein, first check valve means for introducing air into said first chamber for pressurizing said first chamber an inflated bladder, defining a closed chamber therein adapted to be filled with air, disposed in a hollow rod of said piston and defining a third chamber between said bladder and said piston in open communication with said first chamber, second check valve means for introducing air into said closed chamber for pressurizing the closed chamber, a continuously open orifice means formed through said head to meter said oil from said second chamber to said first chamber upon extension of said shock absorber, the improvement comprising check valve means mounted in said head at a position thereon separated from said orifice means for preventing communication of said oil from said first chamber to said second chamber upon compression of said shock absorber and for cooperating with said orifice means to open to also meter said oil from said second chamber

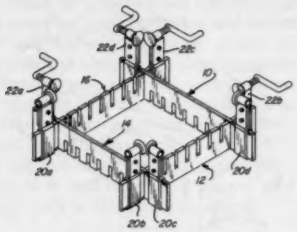
to said first chamber at a controlled rate upon extension of said shock absorber and when the differential pressure of said oil between said first and second chambers exceeds a predetermined level.

4,132,396

GLUEING CLAMP ASSEMBLY

George W. Graham, 2641 S. Gilpin, Denver, Colo. 80210

Filed Apr. 6, 1978, Ser. No. 893,882
Int. Cl.² B23P *19/00*
U.S. Cl. 269—41 **4 Claims**



1. A clamp assembly for rectangular work pieces providing holding on its four corners in four directions, comprising:

(a) four bar clamps each including a bar, lockable carriage means reciprocably mounted on each end of each bar, head means releasably secured to each lockable carriage means with an adjustable stop pad mounted in one head on each bar clamp and an adjustable pressure pad in the opposite head means and means for releasably locking each carriage in a predetermined position on the bar end on which it is mounted, and;

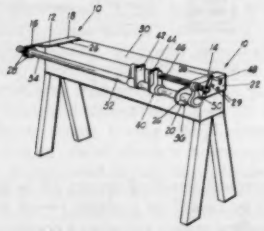
(b) a plurality of spaced slots in each bar extending from one edge of the bar to approximately the center thereof, arranged to mate with a slot of the other bars forming a rectangular frame of the bars with the ends of the bars extending outwardly from the enclosure, with the top edges of the bars in general planar alignment and with said stop pads and said pressure pads in general planar alignment spaced from the plane of the top edges of said bars.

4,132,397

MOUNTING BRACKET FOR A PIPE CLAMP

Emerson Ward, 804 Perry, Wichita, Kans. 67203

Filed Aug. 22, 1977, Ser. No. 826,530
Int. Cl.² A47H *1/14*; B23Q *3/02*
U.S. Cl. 269—252 **4 Claims**



1. In combination a pipe clamp and a mounting bracket therefor comprising:

a pipe member;

a screw support arm attached to an end of said pipe and including a threaded aperture;

a fixed jaw vise member secured to said pipe;

an adjustable jaw vise member slidably engaging said pipe;

a threaded bar member connected to said adjustable jaw vise member and rotatably engaging said threaded aperture of said screw support arm;

means for rotating said threaded bar to slide said adjustable bar towards or away from said fixed jaw vise member;

a first support arm having a first end portion and a second end portion, the first end portion having an aperture therethrough, the aperture dimensioned to receive one end of the pipe;

means for securing the end of the pipe to the first end portion of said first support arm;

a second support arm having a first end portion and a second end portion, the first end portion having an aperture therethrough, the aperture dimensioned to receive the other end of the pipe;

the second end portions of said first support arm and said second support arm attached to a stationary object such as a work bench, saw horse, cabinet, and the like, for supporting the mounting bracket thereon;

said first support arm and said second support arm include a flange portion disposed along one side of said arms and longitudinally along the length thereof; and

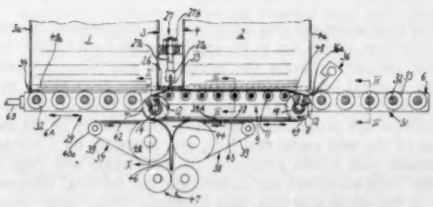
said aperture of said first end portions of said second support arm receives said pipe between said screw support arm and said adjustable jaw vise member.

4,132,398

APPARATUS FOR REMOVING SHEETS FROM STACKS

Otto Erdmann, Hamburg; Reinhard Deutsch, Geesthacht; Horst Symmanek, Neubörnsen, and Willy Rudszinat, Dassendorf, all of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG., Fed. Rep. of Germany

Filed May 10, 1977, Ser. No. 795,563
Claims priority, application Fed. Rep. of Germany, May 22, 1976, 2623125; Jan. 24, 1977, 2702797
Int. Cl.² B65H *3/10, 3/44*
U.S. Cl. 271—9 **21 Claims**



19. Apparatus for removing successive lowermost sheets from a stack of superimposed sheets which is confined in a magazine having an open lower end and wherein the sheets of the stack have overlapping edge portions, particularly for feeding sheets to a tobacco processing machine, comprising a support having a topmost portion disposed at a first level below the lowermost sheet of the stack opposite said lower end of said magazine; rotary withdrawing means adjacent to said support opposite said lower end of said magazine and having at least one topmost portion located at a second level which is different from said first level; means for transporting said support and said withdrawing means in unison along a predetermined path transversely of the stack, said path being adjacent to said open end of said magazine and said support and said withdrawing means being movable to and from an end position in which said withdrawing means is adjacent to the edge portion of the lowermost sheet of the stack in said magazine; means for rotating said withdrawing means in phase with the movement of said support along said path, said withdrawing means including means for attracting the lowermost sheet and for peeling the thus attracted sheet off the sheet immediately thereabove during movement of said withdrawing means and said support along said path and during simultaneous rotation of said withdrawing means; and means for separating

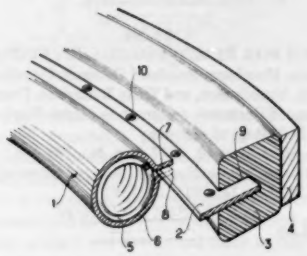
the edge portion of the lowermost sheet from the edge portions thereabove, including at least one separating element, a carrier for said separating element and means for moving said separating element against the edge portion of the lowermost sheet in a direction to move such edge portion away from the edge portion thereabove and nearer to said withdrawing means in said end position of said support and said withdrawing means, said means for moving said separating element including a first lever pivotable about a fixed axis and having an arm articulately connected with said carrier, a second lever pivotable about a second fixed axis, means for articulately connecting said levers to each other and cam means actuatable to pivot said second lever.

4,132,399

COMPOSITE SEAL RING

Jacques Lechanu, Colombes, and Fernand Gilbaut, Domont, both of France, assignors to Societe Anonyme dite: Le Joint Francais, Paris, France

Filed Mar. 15, 1978, Ser. No. 887,411
Claims priority, application France, Mar. 23, 1977, 77 08729
Int. Cl.² F16J *15/12, 15/08*
U.S. Cl. 277—47 **12 Claims**



1. A composite seal ring intended to be compressed between two surfaces which are to be applied against each other in a sealed manner, wherein the composite seal ring comprises firstly a metal seal ring comprising a core constituted by a spiral spring surrounded by a metal sheath which provides two peripheral lips projecting outwardly substantially in the midplane of the said metal seal ring, and secondly by a toroidal elastomer seal which surrounds the said metal seal ring, together with members for connecting the toroidal elastomer seal to the metal seal ring, said members being freely lodged between the projecting lips of the said metal seal ring and being rigidly lodged in a corresponding slot of the said toroidal elastomer seal.

4,132,400

APPARATUS FOR ALIGNING A STACK OF SHEETS

Raymond Naramore, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

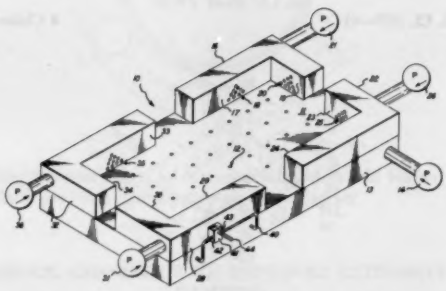
Filed Jun. 29, 1977, Ser. No. 811,405
Int. Cl.² B65H *31/40*
U.S. Cl. 271—221 **2 Claims**

1. Apparatus for aligning a stack of flimsy sheets, comprising:

(a) a perforated platform for supporting the bottom of the stack of sheets;

(b) means for driving fluid through said perforated platform to provide a fluid supporting layer between the platform and the stack of sheets on the platform;

(c) means for simultaneously injecting fluid between the sheets of the stack on the platform to reduce friction between the individual sheets, including at least two opposing L-shaped manifolds connected to a pneumatic fluid source, each said manifold including first and second orthogonally related stack edge aligning walls normal to and extending continuously from the platform adapted to engage all of the sheets in the stack, each of said walls having an array of nozzles directed to provide jets of fluid normal to said stack edge aligning walls and parallel to said platform, said arrays of nozzles extending over said walls continuously upwardly from said platform up to the top of the stack of sheets to impinge the sides of the entire stack of sheets, and the number of nozzles in each said array at a given normal distance above said platform being



inversely related to the normal distance above said platform to provide fluid between the sheet in inverse proportion to the stack height; and

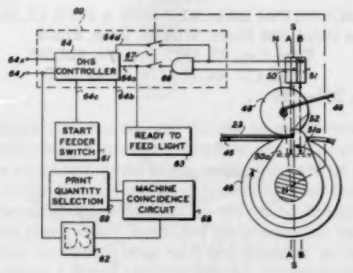
(d) tamping means for tamping all of the sheets of the stack resting on the platform by movement of at least one said manifold parallel said platform towards the stack to bring said fluid jets in said manifold walls directly against the stack during said tamping, whereby tamping of the entire stack aligns all of its individual component sheets.

4,132,401

COPIER DOCUMENT SENSING AND CONTROL SYSTEM

John F. Gauronski, and Thomas A. Havel, both of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 27, 1977, Ser. No. 801,114
Int. Cl.² B65H *9/04*
U.S. Cl. 271—245 **13 Claims**



1. In a document handling system for a copier in which documents to be copied on a copier platen are moved by a document handling system including a document input station upstream of said platen in the desired direction of document movement comprising a document gate and a document sensing system for automatically controlling said document handling system through control means in response to the entry of documents into said document input station, the improvement in said document input station wherein:

said sensing system comprises a first document sensor actuated by the presence of a document slightly upstream of said document gate, and intermediately thereof, and a

second document sensor actuated by the presence of a document downstream of said document gate and intermediately thereof,

said first and second sensors being connected to said control means for initiation of said document handling system for movement of a document through said document gate in response to the actuation of said first sensor and the non-actuation of said second sensor,

said first and second sensors also being connected to said control means as inhibiting means for inhibiting the actuation of said document handling system in response to the actuation of said second sensor, and

disabling means for disabling said inhibiting means during a limited operating cycle following said initiation of operation of said document handling system for enabling a document of a predetermined length to be moved through said document gate past said sensors by said document handling system without said inhibiting means inhibiting operation of said document handling system,

said control means being operative to inhibit further operation of said document handling means in response to the actuation of at least one of said sensors after said limited operating cycle of said disabling means.

4,132,402

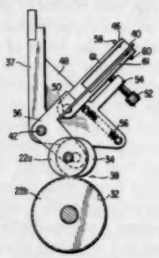
SHEET FEED MONITOR APPARATUS

Wilbur J. Morrison, and Norwood E. Tress, both of Bath, Pa., assignors to Bell & Howell Company, Phillipsburg, N.J.

Division of Ser. No. 594,255, Jul. 9, 1975, Pat. No. 4,043,551, which is a continuation-in-part of Ser. No. 569,989, Apr. 21, 1975, Pat. No. 4,079,576. This application May 17, 1977, Ser. No. 797,881

Int. Cl.² B65H *7/12*

U.S. Cl. 271—263 **12 Claims**



10. In a pull-foot sheet-feeding system comprising:

a sheet supply means for normally supplying sheets, one at a time, said sheet supply means including a reciprocating pull foot and a complementary roller; and

a sheet transporting means for receiving said supplied sheets and further transporting said sheets, said sheet transporting means defining a transporting nip for positively gripping said sheets and transporting them; the improvement of a detection means having complementary gripping members, at least one of which is movable, for defining a detecting nip positioned slightly downstream of said transporting nip for detecting the pre ence of miss or double feeds for each reciprocation of said pull-foot, said detection means further including an elongated detection feeler attached to, and moveable with, said at least one movable gripping member, and wherein is further included a single adjustable point arm supporting detection points thereon, said points being located on opposite sides of the said detection feeler for contacting said detection feeler to indicate movement of said detection feeler in either of opposite directions, said single point arm and said points being laterally adjustable as a unit to simultaneously change the positions of said detection points.

4,132,403

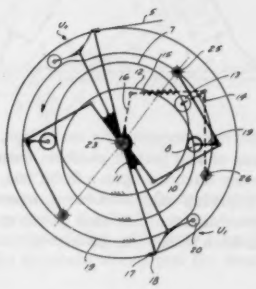
SHEET TRANSFER APPARATUS FOR PRINTING MACHINE

Günter Weisbach, Radebeul, and Regina Wege, Leipzig, both of German Democratic Rep., assignors to Veb Polygraph Leipzig Kombinat fuer Polygraphische Maschinen und Ausruestungen, Leipzig, German Democratic Rep.

Filed Jul. 7, 1977, Ser. No. 813,681

Int. Cl.² B65H *29/06, 5/12*

U.S. Cl. 271—277 **10 Claims**



1. A sheet transfer apparatus for a printing machine, said apparatus comprising:

a pickup station adapted to have a supply of sheets;

a transfer unit rotatable about an axis adjacent said pickup station;

a receiver defining a transfer station adjacent said unit and angularly offset from said pickup station;

means for displacing said receiver at said transfer station at a predetermined receiver velocity;

two grippers spaced angularly apart and independently angularly displaceable on said transfer unit, each gripper including means for picking up a sheet at said pickup station and releasing the picked-up sheet at said transfer station;

means for rotating said unit about said axis at constant angular velocity and for thereby orbiting said grippers past said stations;

means for accelerating each of said grippers relative to said transfer unit and independently of the other gripper as the respective gripper passes from said pickup station to said transfer station, from a displacement rate at which there is no relative movement between the gripper and a sheet located at said pickup station to a displacement rate which is generally equal to said receiver velocity; and

means for decelerating each of said grippers relative to said transfer unit and independently of the other gripper as the respective gripper passes from said transfer station to said pickup station, from a displacement rate which is generally equal to said receiver velocity to a displacement rate at which there is no relative movement between the gripper and a sheet located at said pickup station.

4,132,404

LEG STRETCHING EXERCISE DEVICE

Raymond L. Wilson, 104C Briarridge Dr., Turtle Creek, Pa. 15145

Filed May 27, 1977, Ser. No. 801,062

Int. Cl.² A63B *21/00*

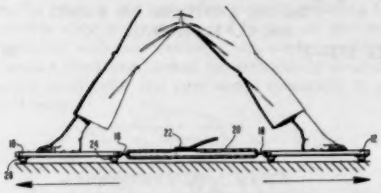
U.S. Cl. 272—109 **7 Claims**

1. A leg stretching exercise device for use on a floor comprising:

a pair of platform means, each said platform means adapted to support a foot of an exerciser on the upper surface of each of said platform; means during an exercise program means for independently rollingly supporting each said

platform means on a floor, and permitting the pair of platform means to move freely in any direction on a floor;

non-rigid means which is non-rigid and non-electric for connecting said platforms whereby said pair of platform means may be placed in touching relationship and moved



apart under the operation of a user's legs, and each platform means of said pair of platform means being freely moved in any direction upon a floor; and,

means for adjusting said connecting means to limit the spaced apart distance that each platform means of said pair of platform means may be moved.

4,132,405

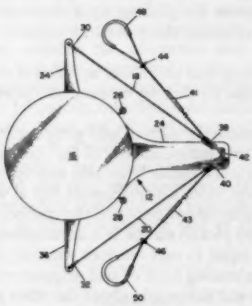
BALANCED SWIVEL EXERCISING DEVICE

Nathan F. Asher, 1015 Sunset Blvd., Arcadia, Calif. 91006

Filed Feb. 16, 1977, Ser. No. 769,045

Int. Cl.[2] A63B *23/02*

U.S. Cl. 272—146 **10 Claims**



1. A dynamic exercising apparatus for the entire body comprising:

a base;

a fixed extending member secured to said base;

a swivel platform rotatably mounted on said base for rotation about a substantially vertical axis;

means including first and second lines slidably coupled to said extending member for balancing and controlling coordinated swivelling of said platform and movement of the arms and body;

first and second handle means connected respectively to said first and second lines but otherwise separate from one another; and

means for attaching said lines from said fixed extending member to opposite sides of said swivel platform to rotate said platform and the lower portion of the user's body in one direction when one of said lines is pulled and in the other direction when the other of said lines is pulled.

4,132,406

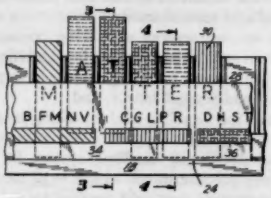
WORD GAME

Kurt Ginsberg, 20 W. 64th St., New York, N.Y. 10023

Filed Nov. 30, 1976, Ser. No. 746,089

Int. Cl.[2] A63F *1/10*

U.S. Cl. 273—1 R **10 Claims**



1. A word game comprising a plurality of bodies each having thereon a letter of the alphabet, with all of the letters of the alphabet being distributed among said bodies and with at least some of said bodies being duplicates, so that some letters appear on more than one body, said bodies being coded into different types of bodies in such a way that a given group of letters of the alphabet belong to one type of bodies which carry the letters of the latter group, while another group of letters of the alphabet belong to a different type of bodies which carry said letters of said other group, so that by noting the type of a body a player will know that the latter body carries one letter of a given group, support means for supporting a row of selected bodies which form a selected word, and cover means for covering the selected row of bodies to an extent sufficient for covering and rendering invisible the letters on the latter row of bodies while rendering the types thereof visible, so that a player viewing the covered row of bodies will know from the type-coding of the bodies that each of the latter bodies has a letter of a given group, said bodies of said selected row being separately shiftable on said support means with respect to said cover means for rendering the letter of a shifted body visible, so that a player who cannot guess the word hidden by said cover means can selectively have certain bodies of the row shifted to render the letters of the shifted bodies visible for providing hints which aid in the guessing of the word which initially is totally hidden by said cover means, said support means supporting the row of selected bodies at an angle with respect to vertical and horizontal planes according to which the row of bodies are conveniently visible to a player, and said support means including a substantially rigid sheet on which the bodies are placed and members situated beneath and fixed to said sheet for supporting the latter at said angle, said sheet having thereon guides defining between themselves spaces for receiving said bodies so that the latter are shiftable between said guides, said cover means being in the form of a second elongated sheet capable of resting on the sheet of said support means covering the bodies on said support means, said sheet of said support means having a shoulder for engaging a bottom edge of said sheet of said cover means to hold the latter at a given location with respect to said support means.

4,132,407

BOWLING TRAINING DEVICE

Leo C. Davis, 3700 Madison, Denver, Colo. 80205

Filed Dec. 17, 1976, Ser. No. 751,253

Int. Cl.[2] A63B *69/00*

U.S. Cl. 273—54 B **1 Claim**

1. A training device for attachment to the elbow region of a bowler's arm, comprising:

an upper frame having a front surface;

a lower frame having a generally planar front surface area centrally thereof;

hinge means connecting said upper frame and said lower frame for pivotal movement about a transverse hinge axis;

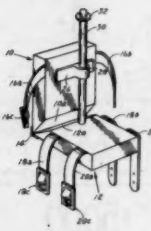
strap means carried by said upper frame, for attaching said

upper frame to the lower biceps of the arm of the bowler, just above the elbow;

strap means carried by said lower frame, for attaching said lower frame to the forearm of said bowler just below the elbow, said hinged upper and lower frames being constructed and arranged to be attached on the inside of the bowler's arm with said transverse hinge axis lying parallel to the elbow so that said frames are pivotable relative to each other between angular and aligned positions when the elbow is moved between bent and straight arm positions, respectively;

bracket means mounted on said front surface of said upper frame in alignment with said generally planar front surface area of said lower frame, and having an elongated bore extending therethrough of substantially uniform diameter and disposed at generally a right angle to said transverse hinge axis; and

an elongated, rigid pin of substantial weight and having an upper and a lower end, said upper end carrying an enlarged head substantially larger in diameter than said elongated bore, the portion of said pin between said enlarged head and the lower end of said pin being substantially straight and having a substantially uniform diameter that is substantially less than the



diameter of said elongated bore, whereby said pin is freely movable by the force of gravity alone through said cylindrical bore;

said rigid pin having a length between said enlarged head and said lower end thereof that is at least as great as the distance measured from the upper end of said elongated bore to the mid portion of said generally planar front surface area of said lower frame, when said upper and lower frame are in an aligned position, and said elongated bore being positioned so that when said upper and said lower frames are in aligned position and said rigid pin is received in said elongated bore, the lower portion of said pin will be in closely spaced relationship to said generally planar front surface area,

whereby the bowler, when wearing said training device, can freely insert said rigid pin into the upper end of said elongated bore, the lower end of said pin resting on said lower frame when the elbow is bent, and said rigid pin falling by gravity through said elongated bore when the elbow is straightened so as to lie in close relationship to said generally planar front surface area, whereby said rigid pin and said hingedly connected upper and lower frames thereafter cooperate to restrain further bending of said elbow.

4,132,408

WEAPON

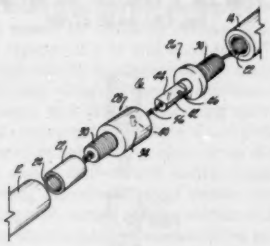
Jack M. Sabat, 233 Surrey La., Clarkston, Mich. 48016

Filed Nov. 17, 1976, Ser. No. 742,668

Int. Cl.[2] F41B *15/02*

U.S. Cl. 273—84 R **8 Claims**

1. A combination nunchaku and night stick weapon comprising a first elongated member having a first and second axial end, a second elongated member having a first and second axial end, means for detachably securing the first end of said first member to the first end of said second member so that said members are coaxially secured together to form a night stick, said detachable securing means further comprising a female portion secured to the first end of the first member, a male portion secured to the first end of the second member, said male portion having an axially outwardly extending shank which is axially slidably received in a recess in said female portion, means for coaxially locking said male and female portions together upon rotation of one member relative to the other, and a flexible means extending between said members,



means for retaining one end of said flexible means to one member and the other end of the flexible means to the other member, said flexible means being sufficiently long to permit axial separation of the members whereupon the weapon is a nunchaku.

4,132,409

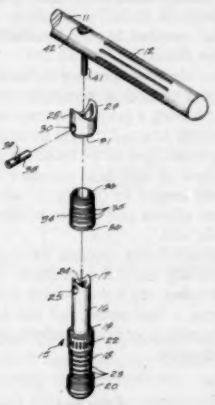
POLICE BATON WITH ROTATABLE CROSSHANDLE

Anthony E. Taylor, P.O. Box D, La Verne, Calif. 91750

Filed Jun. 20, 1977, Ser. No. 807,964

Int. Cl.[2] F41B *15/02*

U.S. Cl. 273—84 R **7 Claims**



1. A police baton, comprising:

an elongated club having a longitudinal axis; and

an elongated crosshandle secured to the club about midway between an end and the middle of the club, the crosshandle having a longitudinal axis which is substantially perpendicular to the club axis, the crosshandle further having a gripping surface, at least a portion of the gripping surface being rotatable with respect to the club, a stationary portion of the gripping surface being of sufficient axial length to enable gripping thereof by several fingers of the user's hand for braking of club rotation.

7. A crosshandle attachment for a polic baton, comprising a handle having a saddle-shaped concave end for fitting against the baton, the handle having a stationary gripping surface and a cylindrical shank between the gripping surface and the concave end; a sleeve rotatably mounted on the shank, the sleeve having an outer surface which defines a gripping surface which is adjacent and movable with respect to the stationary

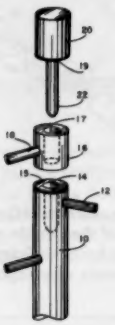
gripping surface; and means for rigidly securing the handle to the baton.

4,132,410

RING TOSS GAME WITH SWIVEL COLLAR

Anthony R. Montagna, Box 241, Cincrest, York, Me. 03909

Filed Jan. 5, 1978, Ser. No. 867,085
Int. Cl.[2] A63B *67/06*
U.S. Cl. 273—100 **7 Claims**



1. An improved ring toss game wherein the improvement comprises:

a post member;

at least one radially projecting arm members extending from said post member;

a projection receipt hollow defined in the top of said post member;

a swivel collar member having a radially projecting collar arm member thereon;

a swivel collar member aperture defined within said swivel collar member extending vertically therethrough;

a cap member having a projection member extending downward therefrom adapted to pass through said swivel collar member aperture and to be received into said projection receipt hollow of said post member so that said swivel collar is held snugly to the top of said post member in a manner that allows said collar member to rotate freely when struck; and

at least one circular ring member having a circular opening defined centrally therein concentric with the exterior of said ring member, the top of which when viewed in cross-section forms a half-circle and the bottom of said ring member forming a concave indentation concentric with the top half-circle.

4,132,411

GAME WITH CHANCE SHOT DICTATING PIECES

Jeffrey D. Breslow, Highland Park, and Alan A. Hicks, Chicago, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 14, 1977, Ser. No. 767,392
Int. Cl.[2] A63F *1/04*; A63D *15/00*
U.S. Cl. 273—119 R **13 Claims**

1. A game apparatus, comprising:

means defining a playing surface;

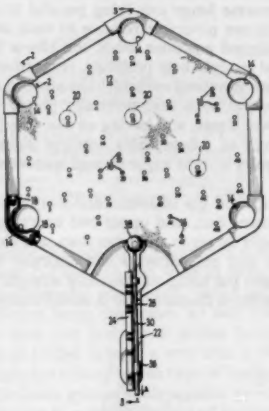
a plurality of rollable playing pieces;

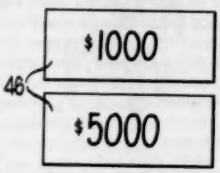
target means for receiving said rollable playing pieces defined on said playing surface;

propulsion means for propelling one of said playing pieces onto said playing surface for travel thereacross;

a plurality of locating means on said playing surface for selectively positioning at least one of said playing pieces; and

chance means including a plurality of chance playing pieces having various indicia means for dictating various playing piece movements, each chance playing piece having a single indicia means for indicating at least one locating means for positioning at least one of said rollable playing pieces and for identifying only one path of travel for a first





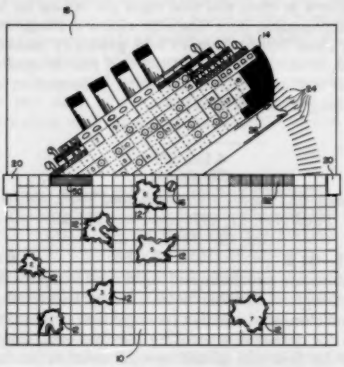
rollable playing piece from the propulsion means into engagement with a second rollable playing on one of said locating means and a different path of for said second rollable playing piece over said playing surface after engagement by said first rollable playing piece.

4,132,412

GAME BOARD WITH PIVOTAL PLANAR MEMBER

John D. Birdsall, 1262 Sunset Plaza Dr., Los Angeles, Calif. 90069

Filed Sep. 27, 1976, Ser. No. 726,974
Int. Cl.[2] A63F *3/04*
U.S. Cl. 273—251 **11 Claims**



1. A game including a game board, said game board comprising a first planar member having inscriptions thereon representing the sea, a second planar member pivotally mounted to

the first planar member and having a representation of a first ship thereon, so that when the second planar member is turned about its pivotal axis the ship represented thereon moves behind the first planar member so as to sink below the sea represented on said first planar member, and a third planar member positioned adjacent the top edge of said first planar member in displaced parallel relationship therewith, said third planar member representing the sky, said second planar member being interposed between said first planar member and said third planar member, said first planar member having a plurality of playing spaces, differentiated game pieces of a size to fit in said playing spaces, and chance means for governing the movement of said pieces.

4,132,413

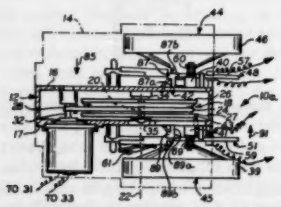
TOY PHONOGRAPH

Alexander W. Hughes, Jr., 19 Wardell Cir., Oceanport, N.J. 07757

Continuation-in-part of Ser. No. 747,484, Dec. 6, 1976, Pat. No. 4,078,808. This application Aug. 19, 1977, Ser. No. 825,940

Int. Cl.[2] G11B *3/00*

U.S. Cl. 274—1 A **28 Claims**



1. A toy phonograph comprising a housing, said housing comprising a base; a turntable rotatably mounted on said base for rotation about an axis of rotation; a first pickup arm pivoted at one end and engageable with a playing surface of a first phonograph record rotatably mount on one side of said turntable; means for pressing said first pickup arm into sound reproducing engagement with said first phonograph record playing surface for reproducing recorded sound from said first phonograph record playing surface during rotation of said turntable; a first speaker cone means resiliently mounted on said housing above said first pickup arm, said pressing means comprising a first spring means resiliently urging said first speaker cone means into sound reproducing contact with said first pickup arm with a biasing force for pressing said first pickup arm into sound reproducing engagement with said first phonograph record for reproducing said recorded sound from said first phonograph record playing surface during said rotation thereof; means for disengaging said first speaker cone means from said resilient sound reproducing contact with said first pickup arm adjacent the end of said first phonograph record playing surface recording whereby said reproducing of said recorded sound is interrupted, said first phonograph record playing surface having a periphery; second spring means, said first pickup arm being constantly placed under a force of said second spring means which urges said first pickup arm toward the periphery of said first phonograph record playing surface; said disengaging means comprising a first lift bar means associated with said first speaker cone means in sound reproducing contact therewith, said first speaker cone means being mounted for movement with said first lift bar means, said movement enabling said first speaker cone means to be urged out of said sound reproducing engagement with said first pickup arm for enabling said first pickup arm to be resiliently reset to the periphery of said first phonograph record playing surface by said second spring means while subsequently returning said first speaker cone means to said resilient sound reproducing contact with said first pickup arm, said first pickup arm comprising a first protrusion extending upwardly therefrom substantially normal to said first phonograph record playing surface and being pivotally movable with said first pickup arm, said first lift bar means comprising a first aperture for receiving said first protrusion therein, said first lift bar means aperture being located above said first phonograph record adjacent the end of said first phonograph record recording, said first protrusion being receivable in said first lift bar means aperture when said first pickup arm is adjacent the end of said first phonograph record recording for interrupting said reproducing of said recorded sound from said first phonograph record playing surface; drive means for rotatably driving said turntable for enabling said reproducing of said recorded sound from said first phonograph record; and bistate switch means for activating and deactivating said drive means dependent on the state of said switch means, said drive means being activated to rotatably drive said turntable in a first state of said switch means and being deactivated to halt said rotatable drive of said common turntable in a second state of said switch means, said switch means comprising electrical contact means located between said first phonograph record playing surface and said first lift bar means, said electrical contact means being normally biased into a closed circuit condition when said switch means is in said first state and being located adjacent said first lift bar means and out of engagement therewith in said closed circuit condition while being located for engagement by said first lift bar means for placing said switch means in said second state when said first pickup arm protrusion is received in said first lift bar means aperture.

4,132,414

GRAMOPHONE TURNTABLE APPARATUS

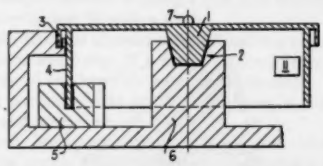
Jack Dinsdale, 9, Bowling Green Rd., Cranfield, Bedfordshire, England

Continuation of Ser. No. 330,068, Feb. 6, 1973, abandoned. This application Sep. 8, 1975, Ser. No. 611,393

Claims priority, application United Kingdom, Feb. 7, 1972, 5660/72

Int. Cl.[2] G11B *3/60*

U.S. Cl. 274—39 R **15 Claims**



1. A gramophone turntable apparatus having a support, turntable, and hydrodynamic bearing means including pumping grooves supporting the turntable for rotation relative to said support, a fluid film of high viscosity being interposed between said bearing and said turntable, the hydrodynamic bearing having pumping grooves for axial thrust support of the turntable, when it is rotating, on said film of fluid pressurized by the bearing means and for the radial support of the turntable on said fluid, and motor means for producing an operative gramophone speed for said turntable, the pumping grooves being dimensioned and orientated for support of the turntable solely by said fluid at speeds below 16 r.p.m.

4,132,415

WIPER APPARATUS FOR CABLE RODS

William D. Langford, Stow, Ohio, assignor to Incom International Inc., Pittsburgh, Pa.

Filed May 10, 1977, Ser. No. 795,533

Int. Cl.[2] F16C *1/26*; F16J *15/56*

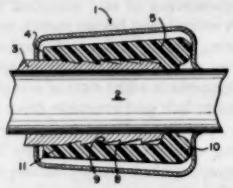
U.S. Cl. 277—12 **12 Claims**

1. Wiper apparatus adapted to be mounted on a cable conduit having a cable rod slidably positioned therein, the conduit

connected to a seal disposed for sealing engagement with the rod, comprising

a forward wall adapted to be positioned exteriorly forward of the seal and having an opening configured for loose contact with the cable rod received therein, and

means connected to the forward wall for supportingly limiting axial displacement of the forward wall, wherein said means comprise an axial portion connected to the forward



wall, a first rearward wall connected to the axial portion and having a first recess configured to engage the conduit, a second rearward wall connected to the axial portion and having a second recess configured to engage the conduit, the first and second recesses adapted to be disposed to enclose a sufficient circumferential portion of the conduit to limit radial displacement of the rearward walls, and means adapted to be connected to the conduit for limiting axial displacement of the rearward walls.

4,132,416

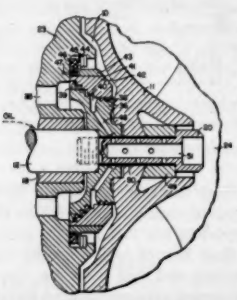
ROTATING ELEMENT FLUID SEAL FOR CENTRIFUGAL COMPRESSOR

Maurice L. Adams, Jr., Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 398,352, Sep. 18, 1973, Pat. No. 3,927,890. This application Aug. 22, 1975, Ser. No. 607,008

Int. Cl.[2] F16J *15/44*

U.S. Cl. 277—18 **1 Claim**



1. In an improved arrangement for inhibiting refrigerant leakage between the discharge pressure space of a centrifugal refrigerant compressor which has an impeller with an inlet side and which is driven by a shaft, and the interior space of a sump chamber containing machinery for driving said shaft, through a leakage path defined between radially outer surfaces of a seal rotor and facing radially inner surfaces of a seal stator, said rotor being fixed for rotation with said shaft and said stator being stationary, said rotor and stator being disposed with one end of said leakage path being in communication with said discharge pressure space and the other end of said leakage path being in communication with said interior space of the sump chamber, the improvement comprising means defining a refrigerant venting passage from an intermediate point along said leakage path to the space at said inlet side of said impeller, said venting passage having a lower resistance to fluid flow than the resistance to fluid flow imposed by those parts of said leakage path between said intermediate point and either end of said leakage path, and having at least a portion of said venting passage extending inwardly into said seal rotor.

4,132,417

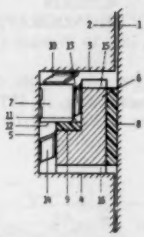
PRESSURE RESPONSIVE SEALING MEANS

Roy S. G. Lagerqvist, Akarp, Sweden, assignor to Kommanditbolaget United Stirling (Sweden) AB & Co., Malmo, Sweden

Continuation of Ser. No. 699,478, Jun. 24, 1976, abandoned. This application Nov. 30, 1977, Ser. No. 856,081

Int. Cl.[2] F16J *9/02, 9/08*

U.S. Cl. 277—27 **7 Claims**



1. A sealing device operable without lubrication located between two relatively movable members such as a piston and a cylinder moving along a motion path to separate two regions containing fluids with substantially different higher and lower fluid pressure magnitudes, comprising in combination, sealing structure presenting a first primary sealing surface comprising a self-lubricating plastic material in contact with the surface of one of said movable members to move therealong over said motion path and presenting a second substantially stationary sealing plastic surface substantially normally disposed to said first sealing surface, a groove in one said member receiving said sealing structure, said second sealing surface being located substantially midway of said first sealing surface, at least one resilient member holding at least said primary sealing surface biased lightly toward contact with its mating surface, and pressure conduit means conveying said fluid of higher pressure against the sealing structure to force both said first and second sealing surfaces together with a force substantially exceeding that of said resilient member and proportional to the differential pressure of the two separated fluids.

4,132,418

SEAL WITH A COMPENSATING THRUST RING

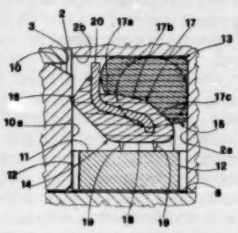
Lino Roli, Modena, Italy, assignor to Italtractor I.T.M. S.p.A., Modena, Italy

Filed Apr. 20, 1978, Ser. No. 898,431

Claims priority, application Italy, May 11, 1977, 40052 A/77

Int. Cl.[2] B62D *55/00*; F16J *15/38*

U.S. Cl. 277—91 **6 Claims**



1. A seal with a compensating thrust ring that acts as a seal

between a first and a second flat surface belonging to a first and to a second member, respectively, spaced axially and in rotation around a common axis, the said first member having a cylindrical housing comprising the first flat surface opposite which the second flat surface is located, essential features of the ring being that it comprises:

a sealing ring made of material highly resistant to wear, of a maximum axial length less than the distance between the said opposite surfaces, and having a rigid internal reinforcing member; the said sealing ring comprising: a front edge whose radial section forms an angle, the vertex of which acts as a thin sealing ring in contact with the second flat surface, and a convex surface to turn around the said axis, this turned towards the cylindrical surface of the housing and having an inclination which initially is practically nil but which increases progressively as the distance away from the said front edge gets greater in such a way that the points of the said surface get gradually closer to the said axis, as the said distance gets greater;

a compensating thrust ring with high elastic deformation characteristics, designed to fit between the first flat surface and the cylindrical surface of the housing and to be coaxially placed in contact with the aforementioned convex surface of the sealing ring, the dimensions of the thrust ring, the sealing ring and the housing, as well as the distance the said two opposite surfaces are apart, being reciprocally correlated in such a way that the thrust ring can be compressed both in an axial and in a radial direction in order to provide the sealing ring with the required thrust in an axial direction against the second flat surface.

4,132,419

OIL SEAL RING FOR ROTARY PISTON ENGINES

Teruo Sunami; Tsuyoshi Morishita, and Kazumi Hatakeyama, all of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Aki, Japan

Filed May 24, 1977, Ser. No. 799,980

Claims priority, application Japan, May 31, 1976, 51-64291

Int. Cl.[2] F16J *15/34*; C22C *29/00, 37/00*

U.S. Cl. 277—96.2 **10 Claims**

1. Oil seal ring for rotary piston engines which comprises a base body formed of an iron based material and sealing lip means for forming a sealing lip on said base body from composite material which includes an iron-based alloy consisting essentially of in weight 3 to 6% of C, 5 to 20% of Co, 1 to 6% of Mo, 1 to 8% of W, and the remainder Fe and having 20 to 60% in volume of composite carbides of Mo, W and Fe produced therefrom, said composite material further including a weight 10 to 50% of at least one of Mo_2C, NbC, TaC and CR_3C_2 dispersed therein.

4,132,420

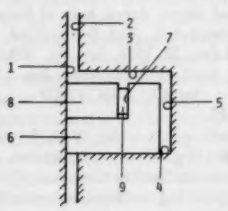
SEALING RINGS FOR STIRLING ENGINES

Gunnar S. K. Lundholm, Lund, Sweden, assignor to Kommanditbolaget United Stirling (Sweden) AB & Co., Malmo, Sweden

Filed Dec. 16, 1975, Ser. No. 641,349

Int. Cl.[2] F16J *9/02*

U.S. Cl. 277—160 **2 Claims**



1. A sealing device for use in an annular recession of a piston in a Stirling engine cylinder comprising in combination, a continuous ring of polymeric material having an L-shaped cross section located in said recession, a second discontinuous ring of polymeric material located in said recession adjacent said continuous ring, resilient means mounted between said rings to force said rings apart in a radial direction tending to hold said discontinuous ring in contact with the cylinder wall.

4,132,421

SHAFT SEAL

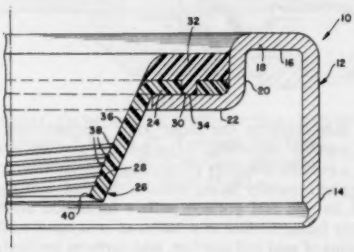
George L. Corsi, Southfield, and Stanley N. Smith, Farmington, both of Mich., assignors to Federal-Mogul Corporation, Detroit, Mich.

Continuation of Ser. No. 550,066, Feb. 14, 1975, abandoned.

This application Aug. 5, 1977, Ser. No. 822,110

Int. Cl.[2] F16J *15/32*

U.S. Cl. 277—166 **5 Claims**



1. An oil seal adapted to be press fitted into a bore of a housing member through which a rotating shaft extends and wherein the seal is to be mounted on such shaft in interference fit therewith so as to exclude the passage of oil along the shaft comprising,

a relatively rigid metal case means,

a wafer-like seal element including an annular frustoconically shaped portion defining a seal lip at one end adapted for interference fit with a shaft,

said wafer-like seal element being of uniform cross-sectional thickness and being of a non-elastomeric material other than metal and heatably unbondable thereto,

a flange portion of said seal element being in juxtaposition with said case means,

elastomeric bonding means for securing said seal element to the case means, said bonding means including a main body portion opposite the flange portion of said seal element from the case means,

said flange portion of said seal element including a plurality of passages in and circumferentially spaced about the flange portion, and said elastomeric bonding means further including secondary portions extending from the main body portion and through each of said plurality of passages and being bonded to the case means whereby said seal element is fixed in place relative to the case means and is prevented from rotating relative thereto.

4,132,422

SEALING MEMBERS FOR UNIVERSAL JOINTS

Ivor G. Sankey, and Colin F. S. Turner, Sutton Coldfield, both of England, assignors to GKN Transmissions Ltd., Birmingham, England

Filed Apr. 14, 1977, Ser. No. 787,519

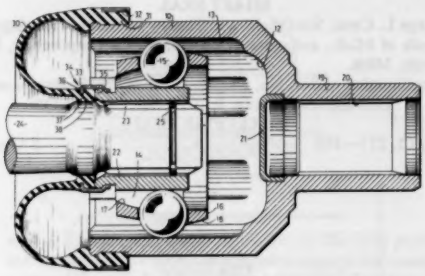
Claims priority, application United Kingdom, May 14, 1976, 19952/76

Int. Cl.[2] F16D *3/02*

U.S. Cl. 277—212 FB **3 Claims**

1. A universal joint comprising an outer joint member defining a cavity, an inner joint member disposed at least partially within said cavity, torque transmitting means interconnecting

the inner and outer joint members for torque transmission while accommodating relative angular movement therebetween, the inner joint member defining a bore therein, a shaft with an end portion removably received in said bore for torque transmission with the inner joint member, and a flexible sealing member for excluding contaminants from said cavity and of generally annular form with a first attachment portion connected to the outer joint member and a second attachment



portion connected to the inner joint member, said flexible sealing member including, adjacent the second attachment portion, a radially inwardly protruding annular bead formation including an inwardly facing surface, the shaft being provided adjacent its said end portion with a formation affording an outwardly facing surface at a radius at least equal to the maximum radius of said end portion, said surfaces sealingly engaging one another when the shaft is in position in the bore.

4,132,423

ATTACHMENTS ENABLING VEHICLES TO NEGOTIATE OBSTACLES

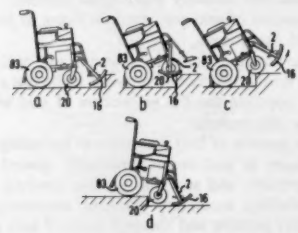
John B. Chant, Alton, England, assignor to Vessa Limited, Hampshire, England

Filed Dec. 5, 1977, Ser. No. 857,640

Claims priority, application United Kingdom, Dec. 9, 1976, 51420/76

Int. Cl.[2] B62B *5/02*

U.S. Cl. 280—5.3 **10 Claims**



1. An attachment for a vehicle, such as a wheelchair, having relatively small wheels to enable such wheels to negotiate obstructions within a predetermined range of heights, such as the curbs of side-walks, the attachment comprising a member for rigid attachment to the vehicle adjacent a wheel, a strut pivoted to said attachment member about an axis, the attachment member being formed for the axis to lie in a horizontal plane above the wheel and perpendicular to the direction of travel of the vehicle, an arcuate rocker end, centred on said axis, fixed to the end of said strut remote from said axis, a first abutment member secured to said attachment member, a second abutment member mounted for to-and-fro movement with said strut over at least part of the range of movement of said strut, a spring operative to hold said first and second abutment members in contact with one another when said strut is in a ready position for negotiating an obstruction, said spring being fitted so as to be in a strained condition when said abutment members are in contact, and means interposed between said strut and said spring operative further to strain said spring, when, in the forward movement of the vehicle, said arcuate rocker end engages an obstruction thereby being swung backwards with respect to the vehicle, said strut being of such length that when said rocker end engages an obstruction within said predetermined range of heights, the vehicle is lifted in the zone of the wheel enabling the wheel to pass onto the obstruction and said rocker end to be returned by said spring to the ready position determined by said abutments.

4,132,424

DEVICE FOR REMOVABLY CLAMPING A SKATE TO THE SOLE OF A SKATING SHOE

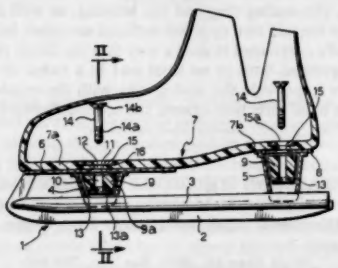
Icaro Olivieri, Treviso, Italy, assignor to ICESLJ AG, Vaduz, Liechtenstein

Filed Jun. 3, 1977, Ser. No. 803,188

Claims priority, application Switzerland, Jun. 4, 1976, 7102/76

Int. Cl.[2] B60K *27/00*

U.S. Cl. 280—11.3 **2 Claims**



1. A device for clamping a skate to the sole of a skating shoe, said skate being of the type comprising a blade longitudinally fixed to an elongated tubular body which supports by means of at least two hollow spacers plate means adapted to be fixed to the skating shoe, said device comprising a body of elastically deformable material positioned in each of said hollow spacers and traversed by a hole which extends perpendicular to said plate means, at least two removable screw-nut clamping units, the nut of each clamping unit being fixed to said body of elastically deformable material in alignment with said hole at the end thereof farthest from said plate means, the screw of each clamping unit being inserted in freely rotatable condition in holes extending through the sole and in the plate in alignment with the hole in said body within the respective hollow spacer, said screw of each unit having a head which bears upon the sole through an intermediate small perforated plate lodged in a respective seat made in the sole in alignment with said holes.

4,132,425

MULTI-WHEEL IN-LINE ROLLER SKATES

Aladar Lehner, and Istvan Varga, both of Budapest, Hungary, assignors to Duoroll A.G., Zug, Switzerland

Filed Jun. 28, 1976, Ser. No. 700,347

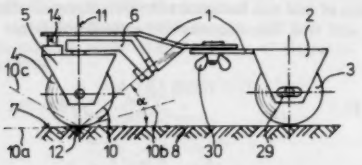
Claims priority, application Hungary, Jun. 27, 1975, LE 774

Int. Cl.[2] A63C *17/02*

U.S. Cl. 280—11.23 **7 Claims**

1. A multi-wheel in-line roller skate, having at least one steerable wheel pivoting about a steering axis, and comprising a frame which can be inclined or tilted laterally with respect to the ground, and a steering mechanism controlling the steering movements of the steerable wheel, and pivotally connected to the frame on a tilting axis which is inclined in relation to the ground surface as defined by the contact points with the wheels, at an angle α where $0 \leqq < \pi/2$, the steerable wheel

also being mounted for pivotal movement relative to the frame about a vertical steering axis, and in which both the tilting axis



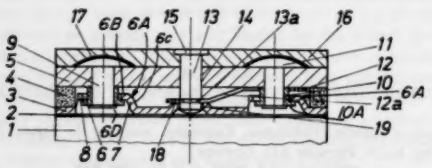
and the steering axis intersect the ground substantially at the point of contact between the steering wheel and the ground.

4,132,426

DEVICE FOR FASTENING AN ATTACHMENT TO A SKI

Josef Svoboda, Schwechat, and Karl Stritzl, Vienna, both of Austria, assignors to TMC Corporation, Baar/Zug, Switzerland

Filed Jul. 5, 1977, Ser. No. 812,671
Claims priority, application Austria, Jul. 16, 1976, 5237/76
Int. Cl.² A63C *11/00*
U.S. Cl. 280—11.37 E **13 Claims**



1. In combination, an attachment member for a ski and a device for fastening said attachment member to a ski, said combination comprising:

a fastening plate and first fastening means for fastening said fastening plate to said ski, said fastening plate having at least one raised portion thereon with an upper wall, encircling sidewall means and a cavity therebeneath;

first means defining an elongate insert slot in said raised portion and communicating with said cavity, the longitudinal axis of said elongate slot extending transversely of the longitudinal axis of said ski, said insert slot having an elongated first segment located in said upper wall of uniform width and a sidewardly opening second segment in said sidewall means of a width greater than said uniform width, both of said first and second segments of said insert slot communicating with said cavity;

second means defining a first opening in said fastening plate adjacent to said raised portion;

an elastic plate positioned between said attachment member and said fastening plate;

at least one coupling pin mounted on said attachment member and having a diameter less than said uniform width of said first segment, said coupling pin having an enlarged end on one end thereof of a width greater than said uniform width of said first segment and less than the width of said second segment, said enlarged head being received in said cavity through said second segment when said attachment member is superposed on said elastic plate;

a locking member and mounting means for mounting said locking member to said attachment member, said mounting means including means defining a second opening in said attachment member coaxial with said first opening in said fastening plate when said attachment member is superposed on said elastic plate, said locking member being slidably disposed in said second opening and movable between a first position retracted from said first opening and a second position received in said second opening, said locking member when in said second position preventing a movement of said attachment laterally of said longitudinal axis of said ski and a removal of said enlarged head from said cavity through said second segment to thereby effect a locking of said attachment member to said fastening plate;

resilient means connected to said locking member and said attachment member for continually urging said locking member into said second position; and

manually engageable means connected to said locking member for facilitating a movement of said locking member to said first position against the urging of said resilient means to permit a movement of said enlarged head laterally of said longitudinal axis of said ski through said second segment to permit a release of said attachment member from engagement with said fastening plate.

4,132,427

ANIMAL CARCASS TRANSPORTING DEVICE

James R. McGee, 5 Porter Pl., Towanda, Pa. 18848

Filed Dec. 2, 1977, Ser. No. 856,623
Int. Cl.² B62b *15/00*
U.S. Cl. 280—19 **1 Claim**

1. An animal carcass transporting device for transporting an animal carcass, said animal carcass transporting device comprising

a sled having a pair of elongated substantially linear first and second frame members having spaced opposite first and second ends, each bent upwardly at an angle to itself at its first and second ends, said first and second frame members constituting the sides of the sled, a plurality of spaced substantially parallel cross frame members affixed to the first and second frame members and extending substantially perpendicularly thereto and supporting said first and second frame members in spaced substantially parallel relation, and first and second runner members having spaced opposite first and second ends, each bent upwardly at an angle to itself at its first and second ends, the first and second runner members being affixed at their first and second ends to the first and second frame members, respectively, and extending beneath said first and second frame members;

a first pair of straps affixed to the first and second frame members and coupleable to each other for releasably securing an animal carcass to the sled;

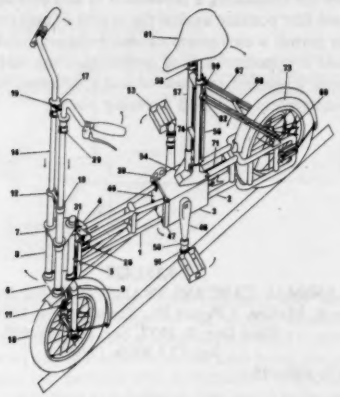
a second pair of straps affixed to the first and second frame members in spaced relation with the first pair of straps and coupleable to each other for releasably securing the animal carcass to the sled; and

pulling strap means affixed to a cross frame member adjacent the first ends of the first and second frame members for facilitating pulling of the sled.

4,132,428
FOLDABLE BICYCLE

Alan Lassiére, Surrey, England, assignor to A. Lassiére Ltd., Surrey, England

Filed May 23, 1977, Ser. No. 799,768
Claims priority, application United Kingdom, May 21, 1976, 21076/76
Int. Cl.² B62K *15/00*
U.S. Cl. 280—278 17 Claims



1. A portable foldable bicycle comprising a main frame divided into a front frame part and a rear frame part which are hingedly connected together, a front fork and a steering assembly hingedly and slideably connected to the front frame part, a saddle supporting assembly hingedly connected to the rear frame part, and locking means provided in operative association with each of the hinged connections, a main hinge pin arranged at one side of the main frame at its approximate mid point to permit the front half and the rear half to be positioned side by side in the folded position, a pair of apertured lugs on the hinge plate of the front frame part, to act with corresponding openings formed in the rear frame part, the lugs being locked in position by two spring loaded tapered bolts, in which the front fork and steering assembly comprises a fork supporting a front wheel, an inner tube fixed to the front fork, rotatably mounted in bearings supported in an outer tube attached at its upper end to a slideable bracket in such a way that the whole front assembly may be pivoted about the transverse axis of the bracket and then slid back above the front frame part, and a handlebar assembly attached to the front fork.

4,132,429
COLLAPSIBLE STROLLER

Rosalind G. Woods, 1050 Carmona Ave., Los Angeles, Calif. 90019

Filed Sep. 7, 1977, Ser. No. 831,189
Int. Cl. B62d *21/14*
U.S. Cl. 280—647 10 Claims

1. A stroller comprising:

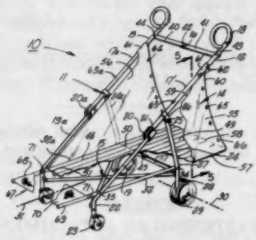
two opposite side sections each having a pair of wheels at its lower end and an upper end portion by which a person manipulates the stroller;

said sections being foldable longitudinally to a reduced length condition;

means connecting said two sections for movement laterally toward and away from one another between collapsed positions in close proximity to one another and more widely laterally spaced positions of use;

flexible material forming a seat extending between said two side sections, and forming also a seat back which can swing between a generally upright position for supporting the back of a sitting child and a downwardly and rearwardly swung more horizontal position for supporting a child lying more horizontally;

two flexible opposite side panels connected to opposite edges of said seat back and extending upwardly therefrom to said two side sections respectively to retain a child



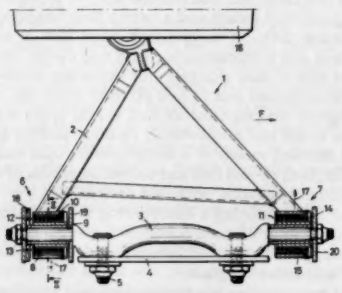
leaning against the seat back in a plurality of different positions thereof; and

means for supporting said seat back in said different positions with said side panels extending between the seat back and side sections.

4,132,430
WHEEL SUSPENSION ARRANGEMENT FOR MOTOR VEHICLES

Manfred Bantle, Vaihingen, Germany, assignor to Firma Dr. Ing. h.c.F. Porsche AG, Germany

Filed Apr. 12, 1977, Ser. No. 786,757
Claims priority, application Fed. Rep. of Germany, Jun. 22, 1976, 2627847
Int. Cl.² B60G *7/02*
U.S. Cl. 280—673 10 Claims



1. A double control arm wheel suspension arrangement for a motor vehicle comprising an upper control arm, said upper control arm being mounted by front and rear elastic guide rod bearings to a guide rod axle running approximately parallel to the longitudinal centerline of the vehicle on the vehicle frame, said front elastic guide rod bearing being constructed so as to be more elastic in a horizontal transverse direction away from the longitudinal centerline of the vehicle than toward said centerline and said rear elastic guide rod bearing being constructed so as to be more elastic toward the vehicle longitudinal centerline than away therefrom, such that resilient rearward movement of the upper control arm occurs under action of longitudinal impacts, while undesirable changes which adversely influence driving behavior are prevented during braking and traveling through curves.

4,132,431

WHEEL SUSPENSION

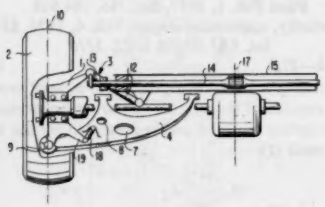
Manfred von der Ohe, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Dec. 6, 1976, Ser. No. 747,931

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1975, 2554715

Int. Cl.[2] B62D 7/10

U.S. Cl. 280—691 15 Claims



1. A wheel suspension having mutually opposite wheels on a common wheel axle, with differing swinging lengths in case of unidirectional spring movements by said mutually opposite wheels as compared to alternate spring movements by said mutually opposite wheels, which wheel suspension comprises a wheel spring means as well as a wheel guide means pivotally connected on a body side and loaded by the wheel spring means, characterized in that the wheel guide means is pivotally connected on a wheel side at a point at least approximately within the wheel center longitudinal plane and at least approximately within a vertical cross plane extending substantially transversely thereto, both of said planes substantially containing a point of contact of the wheel with a road.

4,132,432

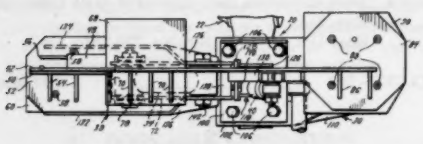
AIR RIDE SUSPENSION ASSEMBLIES

John E. Raidel, Rte. 9, Box 400-M, Springfield, Mo. 65804

Filed Oct. 1, 1976, Ser. No. 728,869

Int. Cl.[2] B60G 11/26

U.S. Cl. 280—711 17 Claims



1. A suspension assembly for a vehicle for mounting the vehicle chassis to a vehicle axle, comprising a hanger depending from the chassis and rigidly supported thereto to form a member thereof, a beam extending generally in the fore and aft direction, means for rigidly mounting said axle to said beam to define an axle and beam assembly, said beam comprising a wishbone having members extending generally from said axle and past said hanger on both the inboard and outboard sides of said hanger, said beam members moving generally up and down relative to said hanger during loading and unloading of the axle, spring means mounted forwardly and rearwardly of said hanger between said beam and said chassis for resiliently resisting movement of the axle and beam assembly during loading and unloading of the axle, and parallelogram means connected between said chassis and said axle and beam assembly for maintaining the pitch of the axle and beam assembly constant during loading and unloading of the axle.

4,132,433

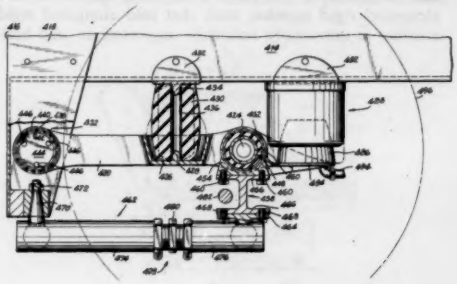
MULTIPLE AXLE SUSPENSION SYSTEM

Elwood H. Willetts, 102 S. Penataquit Ave., Bay Shore, N.Y. 11706

Continuation-in-part of Ser. No. 706,730, Jul. 19, 1976. This application Jun. 16, 1977, Ser. No. 807,002

Int. Cl.[2] B60G 11/20

U.S. Cl. 280—712 5 Claims



1. A vehicle axle suspension system operatively providing a progressively increasing spring rate, comprising, in combination: a vehicle frame structure, a support bracket depending from and secured to said vehicle frame structure, a support trunnion assembly secured to said support bracket, a load-bearing vehicle axle disposed below said frame structure, a suspension beam member cooperatively interconnecting said trunnion assembly and said vehicle axle at first and second points thereof, respectively, said suspension beam member extending rearwardly beyond said second point to a portion thereof comprising a lower air spring seat, a cooperating upper air spring seat secured to said vehicle frame, a lower spring seat integral with and disposed upon said beam member intermediate said trunnion assembly and said vehicle axle, a cooperating upper spring seat secured to and supporting said vehicle frame, a compressively resilient load-deflectible spring member disposed in contact with and interconnecting said lower and said cooperating upper spring seats, said spring member being operatively compressed between said spring seats under load, said vehicle axle being disposed vertically between said second end portion and a torque rod hingedly interconnected to both said support bracket and said vehicle axle, and an air spring assembly disposed in contact with and interconnecting lower and cooperating upper air spring seats, said air spring assembly being operatively compressed between said air spring seats under load.

4,132,434

VEHICLE SEAT AND SAFETY SEAT BELT ASSEMBLY

Fujio Takahashi, and Harutoshi Tsujimura, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited and Ikeda Bussan Company, Limited, both of Yokohama, Japan

Filed Dec. 10, 1976, Ser. No. 749,434

Claims priority, application Japan, Dec. 11, 1975, 50/166273[U]

Int. Cl.[2] B60R 21/10

U.S. Cl. 280—744 5 Claims

2. A safety seat belt assembly for a seat which includes a seat cushion portion and a backrest portion mounted on said seat cushion portion, said safety seat belt assembly comprising:

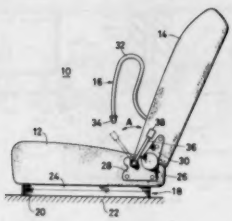
(a) a flexible seat belt having one end thereof mounted on one side of said seat and the other end thereof equipped with a first fastening member, said seat belt being capable of crossing said seat to restrain a passenger sitting thereon;

(b) an elongated rigid member positioned on the other side of said seat, having at its upper end a second fastening member which is engageable with said first fastening member for restraining a passenger in said seat;

(c) an elongated shaft having one end secured to a lateral

side of said seat cushion portion on the side opposite to which said flexible seat belt is attached, and the other end having a ball-shaped head portion;

(d) a socket portion comprising a hemispherically flanged hole integrally formed on a lower end of said elongated rigid member into which said ball-shaped head of said elongated shaft is rotatably received, and a cover plate having a hemispherical recess formed therein which faces said flanged hole, said cover plate being secured to said elongated rigid member such that said elongated rigid member is universally rotatably supported on said ball-



shaped head by said flanged hole and hemispherical recess, and is rotatable from a dormant position, in which a longitudinal axis of said elongated rigid member is substantially parallel to a plane defined by the front surface of said seat backrest portion and is rotated in a direction away from said seat cushion portion, to a forward position; and,

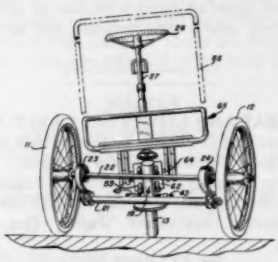
(e) a coil spring disposed about said elongated shaft with one end thereof engaging said lateral side of said seat cushion portion, and the other end thereof engaging said elongated rigid member at its lower end so that said elongated rigid member is biased in said dormant position.

4,132,435

STEERABLE WHEELED VEHICLE

Kenneth L. Wilson, Chenoa, Ill., assignor to Ken Wilson Departures, Inc., Chenoa, Ill.

Filed Jun. 30, 1977, Ser. No. 811,561
Int. Cl.[2] B62K *5/04*; B62D *9/02*; B62K *27/06*
U.S. Cl. 280—772 **8 Claims**



1. A steerable wheeled vehicle, comprising:

a frame;

a rear wheel supporting the rear of the frame;

a pair of steerable, laterally spaced coaxial front wheels having a common wheel axis; and

means supporting the front of the frame on said front wheels, including a kingpin pivot having an axis generally in the longitudinal plane of the frame and inclined with the upper end of the kingpin forward of the lower end and said common wheel axis is spaced forward of the kingpin pivot axis, said front wheels turning with respect to said frame on said kingpin pivot to steer the vehicle, whereby the frame tilts from the vertical in the direction of steering of the front wheels.

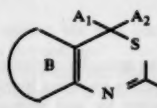
4,132,436

RECORDING MATERIAL

Sadao Ishige; Hideo Usui, both of Minami-ashigara, and Keiso Saeki, Fujimiya, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Feb. 1, 1977, Ser. No. 764,618
Claims priority, application Japan, Feb. 4, 1976, 51-11074
Int. Cl.[2] B41M *5/22, 5/18*
U.S. Cl. 282—27.5 **16 Claims**

1. A recording material comprising (1) at least one thiazine compound capable of forming a color when contacted with an electron accepting material and represented by the following general formula (I):



(I)

wherein A_1 and A_2 may be the same or different and represent an aryl group or a 5 or 6-membered hetero ring residue containing a hetero atom selected from the group consisting of oxygen, sulfur and nitrogen atoms and at least one of A_1 and A_2 representing an electron donating heterocyclic ring or an electron donating fluorene ring or an aryl group substituted with an amino group; or A_1 and A_2 combine to form an electron donating hetero ring;

ring B represents an aromatic hydrocarbon ring or a hetero ring;

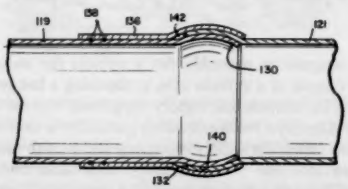
and Y represents a hydrogen atom, an alkyl group, an arylalkyl group, an alkyenyl group, an alkynyl group, an aryl group, a hetero ring residue, an amino group, an amido group, a hydroxy group or a thio group; and (2) an electron accepting material.

4,132,437

INTERLOCKING PIPE BALL JOINT

Terrence A. Green, Columbus, Ind., assignor to Arvin Industries, Inc., Columbus, Ind.

Filed Oct. 18, 1976, Ser. No. 733,352
Int. Cl.[2] F16L *27/04*
U.S. Cl. 285—263 **10 Claims**

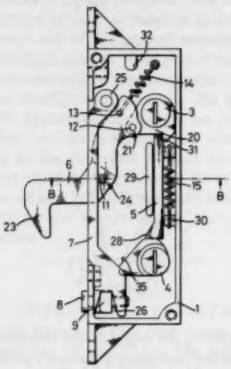


1. A ball joint connection comprising a first pipe having one end; a second pipe having one end; and a sleeve fixed to one of said first and second pipes, said sleeve and said one of said pipes fixed to said sleeve forming a passage open at one end for reception of said one end of the other pipe so that the adjacent ends of said pipes and said sleeve overlap, the overlapping portions of said first and second pipes and said sleeve having concentric generally spherical configurations whereby said first and second pipes are movable with respect to each other.

4,132,438
DEADLOCK LATCH

Barry R. Guymer, Potton Sandy, England, assignor to Schlegel (UK) Limited, Leeds, England

Filed Feb. 18, 1977, Ser. No. 769,910
Claims priority, application United Kingdom, Mar. 28, 1976, 7207/76
Int. Cl.[2] E05C 3/30
U.S. Cl. 292—111 7 Claims



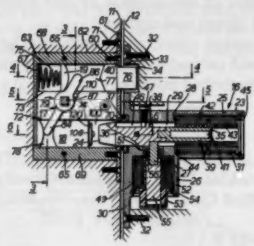
1. A deadlock or latch comprising a body, a first hub, first hub pivotal mounting means for pivotally mounting said first hub on said body, a bolt member, bolt member pivotal mounting means for pivotally mounting said bolt member on said first hub, said first hub pivotal mounting means being disposed on the body remote from said bolt member pivotal mounting means, said deadlock or latch having stop means and said bolt member being biased by a first resilient means so as to maintain a fully open position and a fully closing position in abutment with said stop means, said first hub having a stop member and said deadlock or latch also having a rotatable second hub spaced from said first hub and having a first cam surface, and a slide member having one end biased by a second resilient means into abutment with said first cam surface and being arranged for sliding movement into and out of a locking position engaging said stop member on said first hub when said bolt member is in its fully closing position whereby rotation of said first hub for movement of said bolt member out of its fully closing position may be prevented, and actuating means on said second hub responsive to deflection of said bolt member from its fully closing position for rotating said second hub and first cam surface causing said slide member to move out of its locking position for releasing said first hub member.

4,132,439
DOOR LOCK APPARATUS

Frederick W. Millar, Frankston, Australia, assignor to Access Control Systems Pty. Ltd., Melbourne, Australia

Filed Nov. 18, 1976, Ser. No. 742,742
Claims priority, application Australia, Nov. 21, 1975, PC4055
Int. Cl.[2] E05B 47/00
U.S. Cl. 292—144 9 Claims

1. The combination of
a door surround structure defining a doorway,
a door pivotally mounted on said surround structure so as to be swingable in the doorway between open and closed positions,
a lock structure mounted in the door surround structure and comprising a lock bolt slidable between retracted and extended positions, first electric power means operable to move said lock bolt from its retracted position to its extended position, a bolt locking element which has a bolt locking position in which it engages said lock bolt to hold said lock bolt in its extended position and which is biased toward a bolt freeing position, and second electric power means operable to hold said bolt locking element in its bolt locking position,
a recess in the door to receive the extended end of said lock bolt when said door is in its closed position and said lock bolt is extended, and
a mechanism operable manually from one side of said door such as to be capable of pushing said lock bolt clear of said recess when the second electric power means is inoperative, which mechanism comprises a plunger slidable in

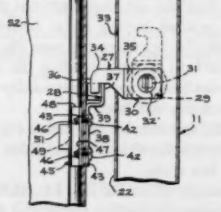


said recess in the direction of movement of said lock bolt between its extended and retracted positions, a hand actuable member mounted exteriorly on the face of said door at said one side of said door and connector means extending through said face of said door and connecting said hand actuable member and said plunger so as to be responsive to actuation of said hand actuable member to cause movement of said plunger within said recess toward the mouth of said recess.

4,132,440
LOCKING ARRANGEMENT FOR A HOUSEHOLD REFRIGERATOR

Thomas O. Johnson, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Sep. 19, 1977, Ser. No. 834,361
Int. Cl.[2] E05B 15/02; F25D 11/00
U.S. Cl. 292—341.19 9 Claims



1. In combination:
a refrigerator cabinet including a compartment having an opening;
a door mounted on said cabinet for closing said opening;
said cabinet having an end wall spaced from said door when said door closes said opening, said end wall defining a side of said opening;
at least one of said door and said cabinet having sealing means to seal said opening when said door closes said opening;
said sealing means having a portion thereof disposed between said end wall of said cabinet and said door; and
locking means to lock said door to said cabinet, said locking means including:
a latch disposed interior of the exterior of said door;
means supported on said door to mount said latch;

said supported means including moving means to move said latch between locked and unlocked positions;

said supported means having means to receive a key or the like from exterior of said door to produce movement of said moving means when the key or the like is activated when in said receiving means so that there can always be movement of said latch by said moving means between its locked and unlocked positions; and

catch means mounted on said end wall of said cabinet in the space between said end wall of said cabinet and said door and exterior of the location of said sealing means when said door closes said opening;

said catch means cooperating with said latch to lock said door to said cabinet when said moving means moves said latch to its locked position.

4,132,441

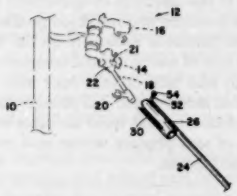
HEAD FOR REMOVING FUSE HOLDER

Murrell W. Watkins, 703 S. Woodlawn, Okmulgee, Okla. 74447

Filed Oct. 17, 1977, Ser. No. 842,597

Int. Cl.[2] A47F *13/06*

U.S. Cl. 294—19 R **1 Claim**



1. An improved hot stick and head therefor for removing a fuse holder from a pole mounted fuse type disconnect switch where the fuse holder is of the type having a tubular body with an eyelet extending radially outwardly near one end of the tubular body, comprising:

a hot stick adaptable to be held in the hands of the user and of a length to extend up to a pole mounted fused disconnect switch;

a tubular open top fuse holder catcher of an internal diameter greater than the external diameter of the fuse holder, the tubular catcher having a slot therein at one side extending from the open top to near the bottom, the slot being of width to slidably receive the eyelet of the fuse holder, the slot being tapered outwardly at the open upper end of the tubular catcher;

means attaching said tubular catcher to the upper end of said hot stick, the tubular axis of said catcher being parallel the axis of said hot stick;

and a hook member affixed to said hot stick at the upper end, the hook member extending radially of the axis of said hot stick and radially of the plane of the axis of said tubular catcher.

4,132,442

APPARATUS FOR PICKING-UP AND REMOVING OBJECTS

Karl O. A. H. Larsson, Industriestrasse 40, Zug, Switzerland

Filed Mar. 25, 1977, Ser. No. 782,261

Claims priority, application Switzerland, Mar. 31, 1976, 4017/76; Nov. 30, 1976, 15093/76

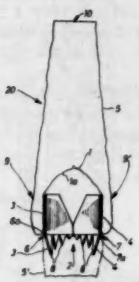
Int. Cl.[2] A47I *13/52*

U.S. Cl. 294—25 **7 Claims**

1. An apparatus for picking-up and removing objects, such as animal excrements, comprising:

an inner container portion for receiving the object to be picked up, said container defining an opening bounded by edges thereof whereby such object can be introduced into the container;

an outer sleeve portion arranged outside the container and extending rearwardly of the container opening, the sleeve portion having a rear end provided with an opening through which the hand of the operator of the apparatus can be inserted to engage the outside of the container, the sleeve portion being foldable over the container portion following picking up of the object; and



means for reinforcing the edges of the container opening, the reinforcing means including forwardly protruding gripper elements formed of relatively stiff material providing along the edges of said container opening, said gripper elements being structured such that they can be inwardly folded towards each other when said gripper elements engage a supporting surface upon which the object to be picked up is disposed.

4,132,443

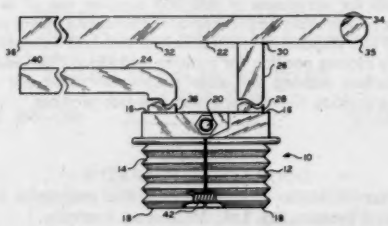
METHOD AND APPARATUS SUITABLE FOR GRIPPING AN ANNULAR WORKPIECE

Cecil H. Timberlake, Oakton, Va.; Willie E. Viverette, Jr., Houston, Tex., and John B. Davidson, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 30, 1977, Ser. No. 782,690

Int. Cl.[2] B25B *9/00*

U.S. Cl. 294—97 **7 Claims**



1. Apparatus comprising:

a gripping member having a first portion, a second portion, a first end and a second end, said first portion and said second portion are hinged together so that the second end of said gripping member is expandable,

a first means and a second means for holding the apparatus wherein said first means is attached to the first end of the first portion of said gripping member and said second means is attached to the first end of the second portion of said gripping member so that when said first means and said second means are forced closer together the second end of the gripping member is expanded, and wherein the first means for holding the apparatus comprises a first member having a first end and a second end wherein said first end is attached to the first end of the first portion of

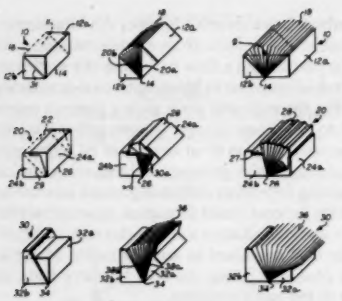
said gripping member and extends a distance outward from said first portion in a plane normal to the direction of expansion of said gripping member, a second member having a first end and a second end, wherein said second member is attached to the second end of said first member between the first end and the second end of said second member wherein the second end of said second member extends a distance in a direction parallel to the direction of expansion of said gripping member and toward the second portion of said gripping member, and the first end of the second member extends a distance in a direction opposite to the second end of the second member and has a third member attached near the first end of the second member in a position essentially perpendicular thereto to form a "T"-shaped handle, and wherein the second means for holding the apparatus comprises an elongated member having a first end and a second end wherein the first end is attached to the first end of said second portion, and wherein said second end extends a distance away from the first portion of said gripping member and essentially parallel to and under the second end of the second member of the first means.

4,132,444

EXPANDABLE VEHICLE

George Beggs, 305 Riverside Dr., New York, N.Y. 10025

Filed Oct. 26, 1977, Ser. No. 845,541
Int. Cl.[2] B60P *3/34*
U.S. Cl. 296—26 25 Claims



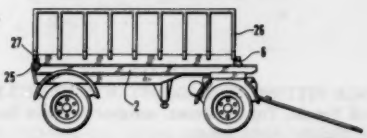
1. An expandable vehiche comprising a vehicle body defining an outer configuration for the vehicle, said vehicle body comprising a movable body panel member and a stationary body frame; and means for joining said movable body panel member to said stationary body frame along a pair of confrontable edges disposed in a plane defining the diagonal of an original enclosed usable volume, said joining means comprising a collapsible accordion type hood and means pivotally connecting said movable body panel member to said stationary body frame for pivotal movement about a pivot axis, said movable body panel member being pivotally movable about said pivot axis through an angle of substantially 90 degrees from a closed position in which said confrontable edges substantially confront each other and said accordion type hood is collapsed to provide said original enclosed usable volume to an open position in which said accordion type hood is expanded to provide an enclosed expanded usable volume, said pivot axis being in a base plane through which said diagonal defining plane extends, said body panel member in said closed position substantially defining a half volume for said originally enclosed volume with said original enclosed volume being substantially bisected by said diagonal defining plane, said accordion type hood circumscribing a path of travel during said pivotal between said open and closed positions which describes an arch for creating an increased headroom for said enclosed expanded usable volume over that of said original enclosed volume which providing a total enclosed expanded volume greater than twice that of said original enclosed usable volume in said open position; whereby substantially the total vehicle enclosed volume may be used in both the open and closed positions of the body panel member with an increase in both headroom and volume being provided in the open position of the body panel member.

4,132,445

APPARATUS FOR SECURING A CHARGE CARRIER AGAINST LONGITUDINAL DISPLACEMENT WITH RESPECT TO A VEHICLE FRAME

Erik H. Jannesson, Skräddaregränd 1, S-445 00 Surte, Sweden

Filed Oct. 27, 1977, Ser. No. 846,151
Int. Cl.[2] B62D *27/06*
U.S. Cl. 296—35 A 5 Claims



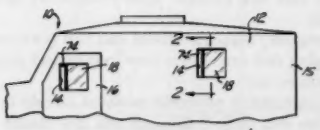
1. In a vehicle having a frame and a charge carrier supported by and longitudinally displaceable with respect to said frame towards and away from a predetermined terminal position on said frame, means for retaining said charge carrier in said predetermined terminal position comprising first stop means on said frame for obstructing displacement of said charge carrier past said terminal position, and second stop means comprising a stop lever angularly displaceable about a fulcrum stationary in said frame between a withdrawn angular position allowing displacement of the charge carrier towards said terminal position, and an operative angular position in which said stop lever obstructs displacement of the charge carrier away from said terminal position in the direction not blocked by said first stop means, and a mechanism for operating said stop lever comprising a reciprocable motor member, a link connected to said lever by a first joint and to said motor member by a second joint, said link being arranged in the operative position of said stop lever to extend at substantially right angles to the direction of the displacement of said motor member, and means for taking up the thrust exerted by said link upon said second joint at right angles to said direction, said means comprising a support member rigidly connected to said frame and having a guide face for slidable engagement with said joint.

4,132,446

ARMORED CAR WINDOW AND WINDSHIELD

Russell E. Bauer, 920 Lakeshore Dr., Grosse Pointe Shores, Mich. 48236

Filed Oct. 14, 1977, Ser. No. 842,223
Int. Cl.[2] B60J *1/16*; F41H *1/00*
U.S. Cl. 296—155 9 Claims



1. A slidable and removable window for an armored car porthole in the form of an opening through the wall of the body of said armored car, said window comprising a frame of adequate over-all dimension to overlap said opening, a pane of bulletproof glass mounted in said frame, a pair of spaced-apart rollers mounted on the bottom of said frame, a channelway fastened to the interior of said body proximate to the lower

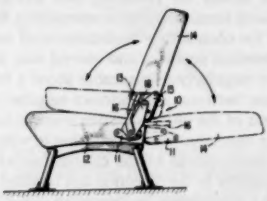
edge of said opening and substantially parallel thereto, said channelway forming a track for said rollers for movably supporting said window frame, a bracket strip in the form of an angle-iron removably mounted substantially parallel to and proximate to the upper edge of said opening with a section thereof having an edge abutting the interior surface of said body and another portion thereof spaced apart and substantially parallel to said interior surface, and retaining means dependent from the upper portion of said frame for engagement with a portion of said bracket strip extending parallel to the interior surface of said body for movably and removably retaining said frame.

4,132,447

HINGE FITTING FOR ADJUSTABLE VEHICLE SEAT

Takami Terada, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Aug. 10, 1977, Ser. No. 823,453
Claims priority, application Japan, Aug. 30, 1976, 51-103384
Int. Cl.[2] A47C *1/025*
U.S. Cl. 297—367 **10 Claims**



1. A hinge fitting for an adjustable vehicle seat having a seat and a back rest, comprising:

a seat bracket fixedly secured to said seat and provided with a plurality of notch means thereon;

a back rest bracket fixedly secured to said back rest;

a link member rotatably mounted on said seat bracket at one end thereof through first pivot and rotatably mounting said back rest bracket at the other end thereof through second pivot means, respectively;

first means mounted on said link member selectively engageable with one of said plurality of notch means and for restricting rotation of said link member about said first pivot means relative to said seat bracket;

second means mounted on said back rest bracket for permitting rotation of said back rest bracket about said second pivot means relative to said link member upon folding said back rest on said seat and for integrally rotating said back rest and said link member upon rearwardly tilting said back rest;

a handle rotatably supported about said first pivot means for disengaging said first means from one of said plurality of notch means; and

a connecting member rotatably mounted on said link member at one end thereof through said first means and engageable with said second means at the other end disengageable from said second means upon folding said back rest on said seat subsequent to disengagement of said first means from one of said plurality of notch means according to the rotation of said handle lever.

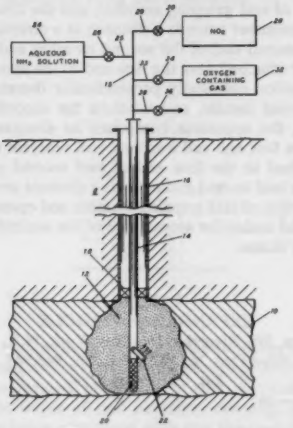
thereby allowing forward folding of said back rest on said seat and also rearward tiltable adjustment of said back rest.

4,132,448

METHOD OF RECOVERING COAL IN AQUEOUS SLURRY FORM

Bruce W. Davis, Fullerton, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 6, 1977, Ser. No. 831,035
Int. Cl.[2] B02C *19/00*; E21C *41/04*
U.S. Cl. 299—5 **9 Claims**



1. A method for recovering lignitic, sub-bituminous or bituminous coal in slurry form from a coal-containing formation comprising establishing a flow path from the earth's surface to a lignitic, sub-bituminous or bituminous coal-containing formation, flowing through said flow path a gaseous mixture containing up to 99 volume percent oxygen and at least about one volume percent NO_2, up to an amount of NO_2 that will remain in vapor phase in said gaseous mixture, and contacting said coal-containing formation with said gaseous mixture to cause a reaction with the coal is said formation adjacent said flow path, flowing an aqueous alkaline solution through said flow path to contact the coal contained in said formation to break up and slurry the coal, and lifting the coal in slurry form from said formation to the earth's surface.

4,132,449

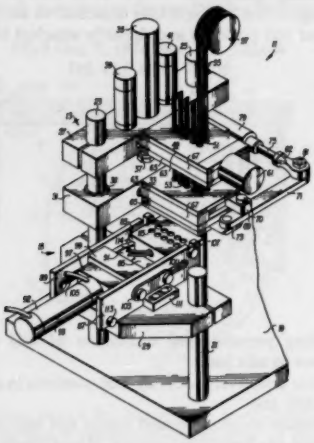
METHOD AND APPARATUS FOR MOUNTING BRISTLES ON BRUSH BACKS

John E. Bergman, Huntington Bay, N.Y., assignor to Blair Tool & Machine Corporation, College Point, N.Y.

Filed Aug. 26, 1977, Ser. No. 828,061
Int. Cl.[2] A46D *1/08*
U.S. Cl. 300—4 **13 Claims**

11. A method for mounting plastic brush bristles on bristle-mounting portions of a plastic brush back comprising the steps of holding the tips of bristle strands and the brush back opposite one another, moving a heating element between said bristle tips and said brush back, simultaneously bringing said bristle tips and said brush back into contact with said heating element to heat the tips of the thusly-held brush bristles and the bristle-mounting portions of the thusly-held plastic brush back until they are partially melted, moving said heating element from between said bristle tips and said brush back and bringing the

partially melted bristle tips into contact with said partially melted brush back, and cooling said partially melted tips and



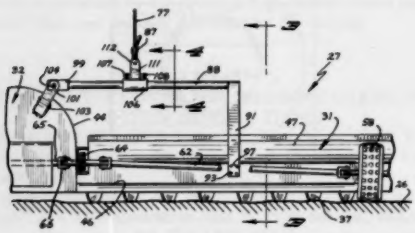
said partially melted portions of said plastic brush back, thereby fusing said bristles to said brush back.

4,132,450

SILO UNLOADER LIFT ATTACHMENT

Glen D. Hansen, Maple Plain, Minn., assignor to Veda, Inc., Long Lake, Minn.

Filed Feb. 3, 1977, Ser. No. 765,398
Int. Cl.² B65G 65/36
U.S. Cl. 302—56 **29 Claims**



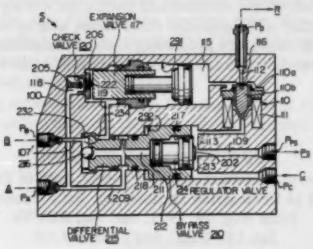
20. A top unloading silo unloader for removing material from a tower silo comprising: a material collector having a frame and means moving material toward the center area of the silo, and an impeller having a housing operable to receive material from the collector and move the material from the housing to a selected location, means for moving the collector around the silo, a lift attachment adapted to be connected to a single lifting cable, said cable operable to pendently support the silo unloader in the silo, said lift attachment having a body, said body having a first end and a second end, said body being located above said collector and extended generally parallel to the collector, first means attaching the first end of the body to the housing, second means attaching the second end of the body to the frame, and third means on the body between the first and second end thereof for accommodating the single cable whereby the cable pendently supports the silo unloader between the first and second ends of the body.

4,132,451

ANTI SKID CONTROL VALVE

Kazuaki Shimizu, Fujisawa, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Aug. 18, 1977, Ser. No. 825,849
Claims priority, application Japan, Aug. 21, 1976, 51-99994
Int. Cl.² B60T 8/06
U.S. Cl. 303—116 **11 Claims**



10. In an anti-skid unit having a regulator valve for regulating a hydraulic fluid pressure from a source of pressurized hydraulic fluid, first and second parallel hydraulic paths disposed between a brake master cylinder and brake units;

an expansion valve which normally opens the first hydraulic path under the action of the fluid pressure regulated by the regulator valve and, when a pressure slackening signal is produced, closes the first path; and

a by-pass valve for opening the second hydraulic path only when a failure occurs in the hydraulic pressure source;

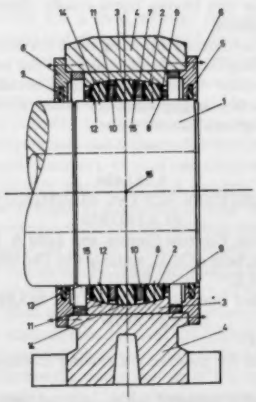
the anti-skid unit being characterized in that said regulator valve and said by-pass valve are arranged co-axially and that said regulator valve is slidably received in said by-pass valve.

4,132,452

SLIDE-ARTICULATION BEARING, IN PARTICULAR FOR TILTABLE CONVERTERS

Ernst Riegler, Enns, and Manfred Schmidt, Linz, both of Austria, assignors to Vereinigte Osterreichische Eisen-und Stahlwerke - Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Dec. 12, 1977, Ser. No. 859,443
Claims priority, application Austria, Dec. 30, 1976, 9810/76
Int. Cl.² F16C 17/00, 21/00
U.S. Cl. 308—3 R **7 Claims**



1. In a slide-articulation bearing arrangement, in particular for tiltable converters, for supporting a shaft therein and being

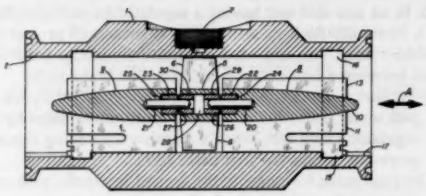
of the type including a circular-cylindrical sliding face forming a unit with said shaft, sliding elements contacting said circular-cylindrical sliding face, a cage holding said sliding elements and having an inner side and an outer side, and an outer race having a spherical inner face for accommodating wobbling movements of said shaft, the improvement which is characterized in that said cage is provided with radially directed recesses open towards said inner side and said outer side of said cage, said sliding elements being inserted in said recesses so as to project out of said recesses and having outwardly projecting ends provided with spherical outer faces, said spherical outer faces of said outwardly projecting ends of said sliding elements contacting and cooperating with the spherical inner face of the outer race.

4,132,453

TURBINE METER BEARING

Billy S. Burrus, and Michael W. Woodfill, both of Tulsa, Okla., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Aug. 18, 1977, Ser. No. 825,798
Int. Cl.[2] F16C *9/00*; G01F *1/10*
U.S. Cl. 308—238 **3 Claims**



1. A turbine meter including, a conduit form of housing defining a bore through which fluid to be metered is flowed in either axial direction,

two spider supports mounted in the housing bore with the longitudinal axes thereof aligned with each other and with the axis of the housing bore,

a shaft of ceramic material mounted in each spider support to extend toward each other and in alignment with the longitudinal axis of their respective spider supports,

a washer body of ceramic material mounted in each spider support and providing a flat surface extending normal to the axis of the housing bore about each said shaft,

a rotor positioned between the spider supports and engaged by the fluid flowing through the housing bore to cause rotation of said rotor, and

bushing members of ceramic material mounted in each end of the rotor and having bores axially aligned to journal over said shafts,

said bushing members protruding from the ends of said rotor and providing flat surfaces facing the flat surfaces of said ceramic washer bodies to provide a ceramic-to-ceramic bearing surface engagement for either direction of fluid flow through said housing bore.

4,132,454

THREE POSITION SEWING MACHINE CABINET PLATFORM

Ralph E. Johnson, Convent Station, and John A. Urciola, South Bound Brook, both of N.J., assignors to The Singer Company, New York, N.Y.

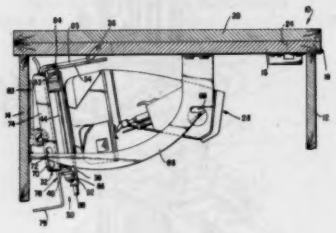
Filed Dec. 22, 1977, Ser. No. 863,549
Int. Cl.[2] A47B *81/00*
U.S. Cl. 312—27 **6 Claims**

1. A platform for mounting a sewing machine in a cabinet comprising:

a base pivotally mounted within said cabinet;

a sewing machine mounting cradle arranged in parallel relation to said base;

a plurality of hinges interconnecting said cradle in said base for selectively raising and lowering said cradle between a first position adjacent said base and a second position vertically spaced above said base, each of said hinges having a first end pivotally attached to said base and a second end pivotally and shiftably attached to said cradle



enabling perpendicular translation of said cradle with respect to said base;

means for selectively securing said platform in an operative position; and

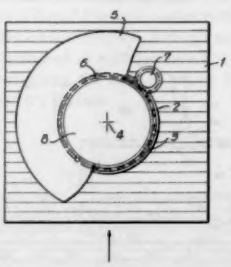
guide means attached to said cradle and said base for preventing any horizontal shifting of said cradle.

4,132,455

CIRCULAR TRANSFER TABLE

Walter Binoth, Jongny sur Vevey, Switzerland, assignor to ISM Equipements Industriels de Montage SA, Lausanne, Switzerland

Filed Sep. 23, 1977, Ser. No. 837,044
Int. Cl.[2] A47B *11/00*
U.S. Cl. 312—97.1 **1 Claim**

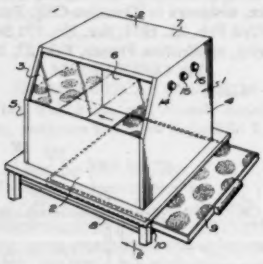


1. The combination comprising a work table having a flat upper surface, a transfer table superposed on said upper surface of the work table, an annular slideway provided at said flat upper surface of said work table, an endless chain slidably received in said slideway, pinion means meshing with said chain for driving the chain in said slideway, said pinion means comprising a drive pinion, said slideway having an opening in which said drive pinion extends to engage said chain in driving relation, said chain including rollers and connecting axles, said connecting axles being secured to said transfer table at the lower surface thereof to drive the transfer table in rotation as the chain is driven in said slideway, said transfer table being constituted as a ring-shaped member having a central opening which is completely open and unobstructed, the upper surface of the work table being exposed beneath said central opening, said transfer table covering said slideway and chain and said pinion means, said ring-shaped member having an upper work surface.

4,132,456
MERCHANDISE MULTIPLYING DISPLAY

David G. A. Lewis, and Michael G. Connolly, both of Darlington, England, assignors to Dacon Display Services Limited, England

Filed Oct. 7, 1976, Ser. No. 730,460
Int. Cl.[2] A47B 77/08
U.S. Cl. 312—223 12 Claims

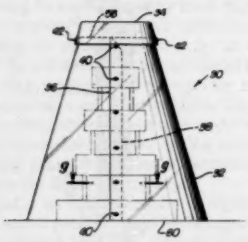


1. In a display device for displaying a sheet-material sample in such a way that it appears to extend over an area greater than that of the sample, cabinet means having a hollow interior and formed with a viewing opening through which the hollow interior of the cabinet means may be viewed, said cabinet means including at least one pair of parallel walls which are spaced from each other and which have inner, flat, parallel, light-reflecting, image-forming surfaces facing each other and defining part of the hollow interior of said cabinet means, and said cabinet means also including a support means situated adjacent said walls for removably supporting a flat sheet-material sample in a position extending between said walls directly next to edges thereof in a plane perpendicular to parallel planes occupied by said image-forming surfaces thereof, in such a way that images of the sheet-material sample provided by said image-forming surfaces appear to form extensions of the sample, so that a viewer viewing the interior of said cabinet means through said viewing opening thereof will see the sample and the images thereof formed by said image-forming surfaces so as to achieve from the sample the effect which would be provided by the sample when extended over an area greater than that actually occupied by the sample.

4,132,457
PROTECTIVE COVER FOR WEDDING CAKES, OR OTHER DISPLAY ITEMS

Richard A. Parrish, 2070 Swan Dr., Costa Mesa, Calif. 92626, and Douglas R. Parrish, 10085 Sunn Cir., Fountain Valley, Calif. 92708

Continuation-in-part of Ser. No. 520,267, Nov. 4, 1974, Pat. No. 3,957,327. This application Mar. 8, 1976, Ser. No. 664,659
Int. Cl.[2] A47B 47/00
U.S. Cl. 312—284 5 Claims



1. A protective cover for decorative cakes and the like which rest on an underlying support surface, comprising a body portion formed of flexible transparent material with upstanding upwardly convergent walls and including overlapping edges removably connected together by seam means for enclosing the cake in a conical chamber formed between said body portion and the support surface, said body portion further including bottom edge means engaging the support surface at a location displaced from the outer edge of the cake for supporting said body portion over the cake without contacting the cake, and wherein said body portion comprises:

a unitary frusto-conical base member, having a single seam from the top edge to the bottom edge, formed by the overlapping edges of the walls of said base member;

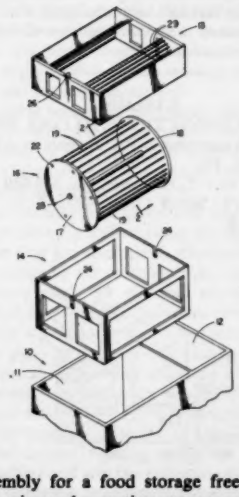
a cap member having a substantially flat top portion and a downwardly divergent portion;

fastening means connected to said cap and base members for removably attaching said cap member to said base member.

4,132,458
ROTATING CHAMBER FOR FOOD FREEZER

James A. Leek, R. 12 Box 317, West Terre Haute, Ind. 47885

Filed Sep. 22, 1977, Ser. No. 835,516
Int. Cl.[2] A47F 3/04; F25D 25/00
U.S. Cl. 312—305 2 Claims



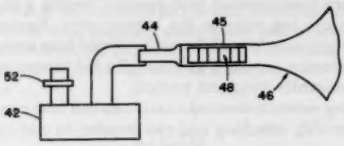
1. An assembly for a food storage freezer comprising a cylindrical housing and mounting means permitting rotation of the housing on a central horizontal axis within said freezer, said housing having circular end plates between which extend spaced parallel members arranged to divide the cylindrical housing into a plurality of chambers of generally cylindrical segmental configuration, and closures for the open tops of each of said segmental chambers, each of said closures being hinged along one of its side margins to said housing and curved to conform to the peripheral curvature of said circular housing end plates, whereby rotation of the housing sequentially presents said chambers for access to their contents, said means for mounting said cylindrical housing including a lower mounting jacket and an upper mounting jacket both of rectangular configuration and sized to fit within the food storage compartment of a freezer in stacked relation, said cylindrical housing being disposed within said stacked mounting jackets and journalled for rotation adjacent the upper margin of the opposite ends of said lower mounting jacket, said upper mounting jacket having members extending parallel to said cylindrical housing above the curved upper surface of the housing to provide a stationary storage area for articles not placed in said housing.

4,132,459

METHOD FOR CATHODE COATING EROSION SUPPRESSION FOR A TELEVISION TUBE

Martin L. Lerner, River Forest, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Mar. 28, 1977, Ser. No. 782,140
Int. Cl.[2] H01J 9/385
U.S. Cl. 316—18 3 Claims



1. For use in evacuating a narrow-neck television tube enevlope having an electron gun in the neck section, a gas-evacuation program comprising:

attaching a vacuum pump to the tube's exhaust tubulation;

operating said pump in a first mode effective to evacuate said tube at a first rate during an intitial pump-down phase when gas volume in the tube is highest; and

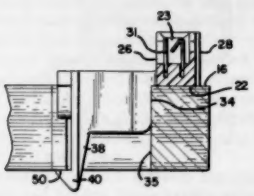
operating said pump in a second mode effective to evacuate said tube at a second higher rate during a subsequent pump-down phase when the gas volume is lower such that the gas velocity through said tubulation is at all times at a low value effective to suppress erosion of cathodes in the gun during evacuation.

4,132,460

ELECTRICAL CONNECTIONS TO COIL WINDINGS

Gary D. Porta, Shiremanstown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 7, 1977, Ser. No. 849,049
Int. Cl.[2] H01R 13/60; H02R 3/50
U.S. Cl. 339—119 R 7 Claims



1. In an electrical connector housing device of the type which is intended to be mounted on a stator and which has a prismatic terminal housing portion having a flat base, the base being intended to be positioned on one face of the stator, and the housing portion having at least one terminal-receiving cavity extending therein which is intended to receive a terminal for connection to a coil winding wire and a lead wire, the improvement to said housing means comprising:

a supporting rib extending laterally from one of the sidewalls of said terminal housing portion, said supporting rib having a supporting surface which extends normally of, and adjoins, said base, said supporting rib having a free end portion which is remote from said terminal housing portion,

flexible clamping finger means extending from said free end portion of said rib, said finger means extending normally of the plane defined by said flat base and in the opposite direction from the direction of said terminal housing portion,

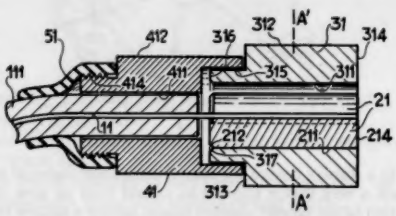
the length of said rib being such that upon positioning said housing portion on one face of a stator with said supporting surface disposed against an internal surface of said stator, said free end of said rib will be located adjacent to the ends of adjacent pole sections of said stator and said finger means will extend through said stator and will serve to clamp said housing device to said stator.

4,132,461

CONNECTING PLUG FOR OPTICAL CABLE

André Jacques; Luigi d'Auria, and Chantal Moronville, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Feb. 23, 1977, Ser. No. 771,365
Claims priority, application France, Feb. 27, 1976, 76 05584
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.20 13 Claims



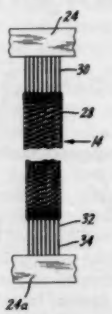
1. A connecting plug for optical cable comprising at least one optical fibre surrounded by a sleeve, said connecting plug comprising: a bushing, a bunch of cylindrical rods arranged inside said bushing; said cylindrical rods having identical circular sections; said bunch including at least one three elements set of said cylindrical rods; each cylindrical rod in said three-elements set having a generatrix in contact with each of its two neighbours in said set; said optical fibre having one generatrix in contact with each of the cylindrical rods of said three-elements set; said bunch externally bearing against the internal wall of said bushing; said connecting plug further comprising an element for coupling said sleeve to said bushing; said bushing being a profiled rigid mechanical body whose inner and outer lateral walls are cut with parallel generatrices; a bonding material being introduced into said bushing for securing said bushing to said rods and said optical fibre.

4,132,462

FILAMENTARY PROJECTION SYSTEM

Hoyt C. Hottel, Jr.; Robert A. Brown, both of Mattapoisett; Randall W. Moore, and Paul F. Sullivan, both of Acushnet, all of Mass., assignors to Acushnet Company, New Bedford, Mass.

Filed Sep. 12, 1977, Ser. No. 832,380
Int. Cl.[2] G03B 21/56
U.S. Cl. 350—117 9 Claims



1. A projection screen comprising:

(a) two spaced support members:
(b) a plurality of substantially parallel and substantially contiguous runs of strands between said support members forming a substantially planar screen surface between said support members;
(c) each of said strands being subjected to an axially directed tension of from about $L^2/7.2$ to about $L^2/36$ pounds where L is the length of said runs in feet; and
(d) each of said strands having a breaking strength greater than 10 pounds.

4,132,463
ZOOM OPTICAL SYSTEM

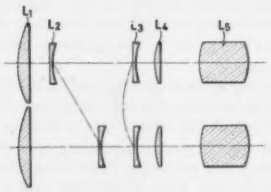
Keiichi Sakaguchi, Yokohama, and Atsushi Someya, Machida, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 565,365, Apr. 7, 1975, abandoned, which is a continuation-in-part of Ser. No. 535,710, Dec. 20, 1974, abandoned, which is a continuation of Ser. No. 410,401, Oct. 29, 1973, abandoned, which is a continuation of Ser. No. 249,615, May 1, 1972, abandoned. This application Oct. 29, 1976, Ser. No. 737,157

Claims priority, application Japan, May 8, 1971, 46/30735; Nov. 18, 1971, 46/92841

Int. Cl.[2] G02B *15/18*

U.S. Cl. 350—184 **15 Claims**



1. A zoom lens system comprising:
(a) a focusing lens group having an optical axis and being movable along the optical axis for normal range focusing;
(b) means for shifting the focusing lens group along the optical axis for normal range focusing;
(c) a variator lens group being movable along the optical axis for varying the focal length of the whole lens system;
(d) a compensator lens group being movable along the optical axis for compensating the image plane shift caused by the movement of the variator lens group;
(e) a cam ring being rotatable around the optical axis and having:
(1) first and second zooming cam grooves within a first predetermined rotating angle for defining movement of the variator lens group and the compensator lens group according to a first predetermined relationship for zooming operation in a normal focusing range, said first zooming cam groove and said second zooming cam groove being formed differently from each other so that said first zooming cam groove shifts the variator lens group along the optical axis in order to vary the focal length of the whole system at the time of the rotation of the cam ring within the first rotating angle and said second zooming cam groove shifts the compensator lens group along the optical axis in order to compensate the image plane shift caused by the movement of the variator lens group at the time of the rotation of the cam ring within the first rotating angle;
(2) a first and a second macrophotographic cam groove within a second predetermined rotating angle following said first rotating angle for defining movement of the variator lens group and the compensator lens group according to a second predetermined relationship for macrophotographing operation in a close focusing range closer than the normal focusing range, said first macrophotographing cam groove and said second macrophotographic cam groove being provided at a portion extended from one end portion of the first zooming cam groove and at a portion extended from one end portion of the second zooming cam groove respectively so as to be continuously shifting from the zooming operation to the macrophotographing operation according to the rotation of the cam ring from the first rotating angle to the second roating angle, said first macrophotographic cam groove being formed so as to position its center line substantially within a plane substantially including the central point of the end portion of the first zooming cam groove and perpendicularly crossing the optical axis in order to maintain the variator lens group stationary at a position corresponding to the end of said first predetermined relationship at the time of the rotation of the cam ring within the second rotating angle,
and said second macrophotographic cam groove being formed so as to shift its center line gradually from a plane substantially including the central point of the end portion of the second zooming cam groove and perpendicularly crossing the optical axis in order to shift the compensator lens group along the optical axis further from a position corresponding to the end of said first predetermined relationship at the time of the rotation of the cam ring within the second rotating angle; and
(3) an opening for defining a finder optical path;
(f) releasable locking means for restricting the rotation of the cam ring between said first and second rotating angles, said cam ring being rotatable continuously from the first rotating angle to the second rotating angle upon the release of said locking means; and
(g) an indicating means for indicating macrophotographing information into the finder optical path, said indicating means including a colored filter member disposed in said opening of the cam ring at a portion corresponding to the second rotating angle;
thereby, the variator lens group and the compensator lens group are mutually shifted along the optical axis according to the first predetermined relationship in the normal focusing range by the rotation of the cam ring within the first rotating angle for effecting zooming, and further, when the locking means is released, the compensator lens group only is independently shifted along the optical axis from the position corresponding to the end of the first predetermined relationship while the variator lens group is maintained in a stationary state at the position corresponding to the end of the first predetermined relationship in the close focusing range by the rotation of the cam ring within the second rotating angle for effecting macrophotographing and also the indication of the macrophotographing operation is achieved automatically in response to the rotation of the cam ring within the second rotating angle by the insertion of the colored filter member into the finder optical path.

4,132,464
LIQUID CRYSTAL DEVICE

Jun Maeno, Sekimachi, Japan, assignor to Hideki Ishii, Tokyo, Japan

Continuation-in-part of Ser. No. 765,592, Feb. 4, 1977, abandoned. This application Feb. 21, 1978, Ser. No. 879,511

Claims priority, application Japan, Feb. 6, 1976, 51-11879

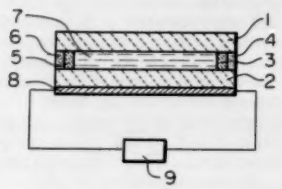
Int. Cl.[2] G09K *3/34*; G02F *1/13*; G01K *11/16*

U.S. Cl. 350—351 **14 Claims**

1. Liquid crystal device comprising a lyotropic-type cholesteric liquid crystal and an enclosure surrounding said liquid crystal, at least a part of which enclosure is transparent so that a color change of said liquid crystal is viewable, CHARACTERIZED IN THAT said liquid crystal is a concentrated solution having a concentration of approximately 50 to 85% by weight, based on the weight of said liquid crystal, of a cellulose derivative in water or an organic solvent; said cellulose deriva-

tive having an average polymerization degree of 30 to 600 and having a chemical structure such that the hydroxyl groups in the cellulose molecule are at least partially substituted with at least one radical, expressed by the following formula, to the extent that the mole number (M.S.) of a hydroxyalkylating agent bonded with cellulose, per anhydro glucose unit of the cellulose molecule is 2.0 to 10.0 at average,

$$-O-X+CHR_1-CHR_2-O\frac{}{m}H$$



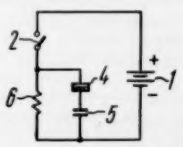
where X is direct bond or —CO—; and, when X is direct bond, R_1 is H or $-CH_3$, and R_2 is a radical selected from $-CH_3$, C_2H_5, $-CH_2A_1$ (A_1 is a radical selected from —OH, halogen, $-OCH_3$ and $-OC_2H_5$) and $-CHA_2-CH_2A_3$ (each of A_2 and A_3 is selected from H, —OH and halogen or both A_2 and A_3 form a double bond together); and when X is —CO—, R_1 is H and R_2 is $-CH_3$; and m is an integer determined depending upon the M.S.

4,132,465

ELECTROCHROME ELEMENT CONTROL DEVICE

Oyars A. Rode; Andrei R. Lusis; Yanis K. Klyavin, all of Riga, and Talivaldis V. Zamozdik, Jurmala, all of U.S.S.R., assignors to Gosudarstvenny Universitet Imeni Petra Stuchki, Riga, U.S.S.R.

Filed Dec. 17, 1976, Ser. No. 751,977
Claims priority, application U.S.S.R., Dec. 22, 1975, 2197453
Int. Cl.[2] G02F *1/00*
U.S. Cl. 350—357 **2 Claims**



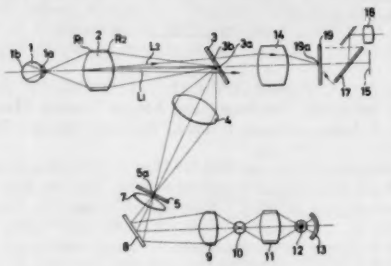
1. An electrochrome element control device comprising: an electrochrome element having two electrodes; a single d-c voltage source having two poles; a switch connected in series between one of the poles of said voltage source and one electrode of said electrochrome element for the supply of the voltage of one polarity to said electrochrome element; a capacitor connected in series between the other electrode of said electrochrome element and the other pole of said voltage source for limiting the time of voltage supply to said element, as well as to accummulate the charge; and a second switch connected in parallel to the circuit composed of said electrochrome element and the capacitor for closing said circuit when said first switch is opened for the discharge of said accummulated charge of the capacitor through said second switch and said electrochrome element as a voltage of the other polarity to said electrochrome element.

4,132,466

OPHTHALMOSCOPIC OPTICAL SYSTEM

Isao Matsumura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 6, 1976, Ser. No. 729,976
Claims priority, application Japan, Oct. 9, 1975, 50-122330
Int. Cl.[2] A61B *3/14, 3/10*
U.S. Cl. 351—7 **8 Claims**



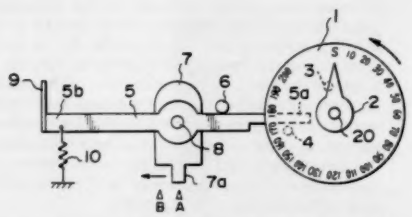
1. An ophthalmoscopic optical system comprising:
(a) a front optical member facing an eye with a fundus to be examined and having an optical axis;
(b) an image forming lens positioned on the image side of said front optical member in axial alignment therewith;
(c) an illuminating arrangement including at least one light source, a lens group and an apertured member and having an optical axis;
(d) a reflecting member having a reflecting plane surrounded by an annular zone, said reflecting plane coinciding with a point at which the optical axis of said front optical member and that of said illuminating arrangement intersect each other, said reflecting plane being positioned to reflect toward the eye light emitted by said light source and passing through said apertured member; of said illuminating arrangement and
(e) said annular zone including a transparent aperture, said transparent aperture being disposed between said front optical member and said image forming lens for passing image-forming rays.

4,132,467

FILM END INDICATING DEVICE FOR MOTION PICTURE CAMERAS

Takashi Tobioka, Omiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed May 12, 1977, Ser. No. 796,390
Claims priority, application Japan, May 12, 1976, 51/59688[U]; May 9, 1977, 52/52775
Int. Cl.[2] G03B *1/60*
U.S. Cl. 352—172 **10 Claims**



1. A film end indicating device for a motion picture camera in which more than one kind of film of different length can be loaded and the exposed length of the film is indicated by a footage counter connected with a film feeding mechanism, said film end indicating device comprising a single movable mem-

ber connected with the film feeding mechanism by way of a single gear train having a certain gear ratio, a plurality of film end detecting means selectively put into operable condition where one of said plurality of film end detecting means cooperates with the movable member to detect the end of the film, a film end indicating means connected with said film end detecting means for indicating that the film has come to its end in response to detection of the film end by one of said film end detecting means, and a change-over means operated to selectively put one of said plurality of film end detecting means into operable condition according to the length of the film.

4,132,468

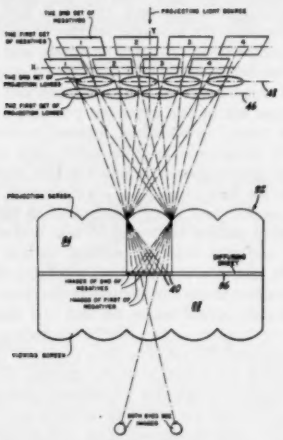
PROJECTION APPARATUS FOR STEREOSCOPIC PICTURES

Allen K. W. Lo, and Jerry C. Nims, both of Dunwoody, Ga., assignors to Dimensional Development Corp., Atlanta, Ga.

Division of Ser. No. 698,064, Jun. 21, 1976. This application Dec. 8, 1977, Ser. No. 858,549

Int. Cl.[2] G03B *21/00*

U.S. Cl. 353—7 **1 Claim**



1. An apparatus for composing a stereoscopic picture of the type comprising (1) a lenticular screen having cylindrical lenticules and (2) an image layer underlying said lenticules and containing a lineiform image band aligned with each lenticule, each band comprising a plurality of condensed images made from a corresponding plurality of two-dimensional photographic recordings taken from a number of spaced vantage points relative to an object field, said apparatus comprising a light source, a plurality M of projecting lenses, and means for supporting a corresponding plurality M of two-dimensional photographic recordings of an object field, each of which recordings contain substantially the entire object field and a plurality $N \leqq M$ of which were taken from different vantage points relative to the object field, in optical relation to said M projecting lenses such that the projected image of a selected common object field element on each recording is in substantial registry with a reference point; wherein the improvement comprises:

means for supporting said plurality M of projecting lenses in a plurality of first rows which are spaced apart in the direction transverse to the lengthwise extent of the first rows and which are offset relative to one another in the direction of the lengthwise extent of the first rows such that the apertures of said M lenses, when viewed in said transverse direction, are arranged substantially in edge-to-edge contiguous relation; and

means for supporting said corresponding plurality M of photographic recordings in a corresponding plurality of second rows, which are aligned with and substantially parallel to respective ones of said first rows such that each photographic recording is aligned with a corresponding one of said projecting lenses and such that said common element on each photographic recording is projected in substantial registry with said reference point;

whereby said M projected two-dimensional recordings may form M condensed images at the rear surface of each lenticule of a cylindrical-lenticule lenticular screen, when said screen is positioned substantially at the place of said reference point with the lenticules thereof aligned lengthwise in said transverse direction, which are substantially contiguous and non-overlapping.

4,132,469

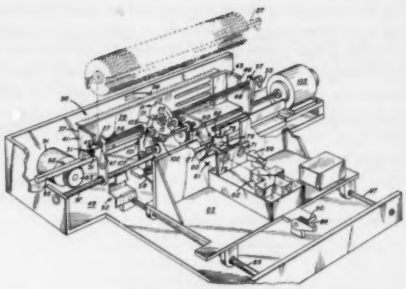
APPARATUS FOR SELECTIVELY VIEWING A PLURALITY OF RECORDING ELEMENTS

Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 7, 1977, Ser. No. 774,719

Int. Cl.[2] G03B *23/06, 23/10*

U.S. Cl. 353—25 **4 Claims**



1. Apparatus for viewing information from interchangeable sets of recording disks; the recording disks each having a periphery and an open segment extending inwardly from the periphery, the sets each including means for releasably aligning the recording elements on a common axis with their open segments in line parallel to the common axis; said apparatus comprising:

a gate defining a viewing plane and a viewing axis, the viewing axis extending through said gate normal to said plane;

means for removably supporting one of the interchangeable sets of recording disks with the open segments of the set in line on said viewing axis;

indexing means for positioning a selected recording disk in said viewing plane for viewing;

means for releasing the releasable aligning means to permit rotation of the selected recording disk in said viewing plane;

a sector key extending along the viewing axis and receivable in the open segments of the disks other than the selected disk for maintaining such open segments aligned on the viewing axis;

means for rotating the selected recording disk in said viewing plane to locate in said gate information to be viewed;

a viewing head; and

means for locating said viewing head on the viewing axis for viewing the information in said gate.

4,132,470

EXPOSURE DEVICE FOR THE MANUFACTURE OF DISPLAY SCREENS OF COLOR TELEVISION DISPLAY TUBES AND DISPLAY TUBE MANUFACTURED BY MEANS OF SUCH A DEVICE

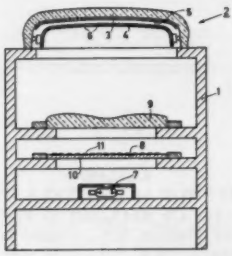
Herman F. van Heek, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 10, 1977, Ser. No. 776,256

Claims priority, application Netherlands, Mar. 17, 1976, 7602752

Int. Cl.[2] G03B *41/00*

U.S. Cl. 354—1 **3 Claims**



1. In an apparatus for exposing a photosensitive layer on a face plate of a colour television tube, said apparatus having a housing for supporting the face plate and an apertured shadow mask in a predetermined relationship, a light source positioned in the housing for exposing the photosensitive layer to light passing through the apertures in the shadow mask and a filter positioned between the mask and the light source for correcting the intensity distribution of the light incident on the photosensitive layer, the improvement wherein said filter has regions of different light transmittance and includes a transparent plate provided with a multiplicity of opaque, substantially parallel, spaced lines, said regions of different transmittance being formed by variations in the width of said lines.

4,132,471

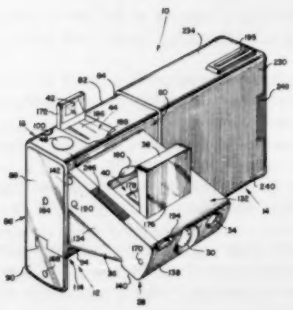
EXPANDABLE SELF-DEVELOPING CAMERA

Thomas A. Svatek, Carlisle, and Richard R. Wareham, Marblehead, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 4, 1977, Ser. No. 784,247

Int. Cl.[2] G03B *17/50*

U.S. Cl. 354—86 **14 Claims**



1. A self-developing camera for use with self-developing film units of the type including an integral supply of fluid processing composition that is adapted to be distributed, after exposure, between predetermined layers of the film unit in response to applying a compressive pressure to the film unit, said self-developing camera comprising:

a first camera section being configured for movement between an erected operative position and a folded inoperative position and including;

a housing;

viewing means, including viewing optical means, mounted on said first section for viewing and framing a scene to be photographed;

means for locating such a film unit at an exposure position within said housing;

exposure means, including exposure optical means, for exposing the film unit at said exposure position;

pressure applying means for operatively engaging and advancing the film unit relative thereto, after exposure, along a predetermined path of travel while applying a compressive pressure progressively along the film unit to effect fluid distribution;

means for advancing the film unit from said exposure position to a position where it is operatively engaged by said pressure applying means;

a second camera section coupled to said first camera section in telescoping relation such that said first and second camera sections are movable relative to one another between extended and retracted positions, said second camera section being configured such that it cooperates with said first camera section when said first and second camera sections are in said extended position, for defining a film unit receiving chamber, located in communication with said predetermined film unit's path of travel, for receiving and releasably retaining film units advanced thereinto by said pressure applying means, said second camera section also being configured so that when said first camera section is located in said folded inoperative position and said first and second camera sections are located in said retracted position, a portion of said second camera section forms a protective cover over said viewing and exposure optical means on said first camera section, said second camera section further including a film withdrawal opening therein providing access to the interior of said chamber for the purpose of removing film units from said chamber through said withdrawal opening; and

film removal means responsive to the movement of said first and second camera sections from said extended position toward said retracted position for automatically engaging and advancing any film units in said chamber through said withdrawal opening.

4,132,472

REPLACEABLE FINDER SYSTEM FOR SINGLE-LENS REFLEX CAMERA

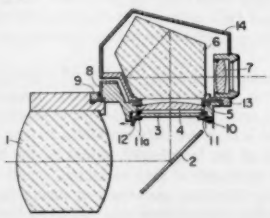
Fumio Urano, Omiya; Akihiro Arai, Tokyo; Takumi Kobayashi, Tokyo, and Junji Umetsu, Tokyo, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 13, 1977, Ser. No. 806,124

Claims priority, application Japan, Jun. 23, 1976, 51-74191

Int. Cl.[2] G03B *19/12, 17/20*

U.S. Cl. 354—155 **7 Claims**



1. In a finder system for a single-lens reflex camera including a camera body, a lens mount disposed on the front of the body and enabling access to the interior thereof, a pivotal reflex

mirror disposed within the body behind the lens mount, a focal plate disposed above the reflex mirror, a penta-prism mounted to the body above the focal plate, and exposure meter display indicia viewable through the penta-prism, the improvements characterized by:

(a) the focal plate being removable through the lens mount in such a manner as to be interchangeable with a selected one of a plurality of available focal plates,

(b) the penta-prism being removable from the camera body in such a manner as to be interchangeable with a selected one of a plurality of available penta-prisms, and

(c) the exposure meter display indicia being disposed between the penta-prism and the focal plate and being independent therefrom, whereby the removal and replacement of the penta-prism and/or the focal plate does not interfere with the meter display indicia.

4,132,473

FILM TRANSPORT STRUCTURE IN A CAMERA

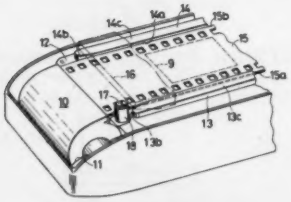
Hidenobu Kondo, Yokohama, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Sep. 22, 1977, Ser. No. 835,600

Claims priority, application Japan, Oct. 5, 1976, 51-134017[U]

Int. Cl.² G03B *17/00*

U.S. Cl. 354—203 **5 Claims**



1. In a camera of the type employing a film cartridge in a film cartridge chamber thereof and having a film take-up spool and a pair of upper and lower film guide rails, each having a flat side surface extending in parallel with the film travel direction and adapted to be in contact with one of side edges of a film to regulate the position of said film drawn from said film cartridge, a film transport structure comprising: a roller member supported by a pin fixed between said film cartridge chamber and said film guide rail, to said camera perpendicularly to a surface of said film, said roller member having a circumferential surface tangential with an extension of said flat side surface of one of said film guide rails.

4,132,474

ELECTROMAGNETIC RELEASE DEVICE FOR USE IN CAMERAS

Hiroshi Ueda, Nara; Takayoshi Miyamoto, and Masatake Niwa, both of Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 2, 1977, Ser. No. 821,109

Claims priority, application Japan, Aug. 4, 1976, 51-92348

Int. Cl.² G03B *9/08*

U.S. Cl. 354—234 **8 Claims**

1. An electromagnetic release device for use in a camera which includes a shutter and an exposure initiating mechanism, said device comprising:

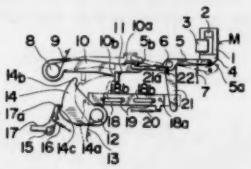
drive means movable from a cocked position to a rest position for actuating said exposure initiating mechanism to allow said shutter to be opened;

a magnetic core;

locking means including an armature and movable between an operative position in which said locking means locks said drive means in its cocked position with said armature in abutment with said magnetic core and an inoperative position in which said locking means releases said drive means and with said armature retracted from said magnetic core;

a permanent magnet providing said magnetic core with a permanent magnetic attractive force to attract said armature to said magnetic core, thereby holding said locking means in its operative position;

a solenoid energizable for generating a magnetic force to



substantially counteract said permanent magnetic attractive force;

means for biasing said locking means toward its inoperative position, the biasing force of said biasing means being smaller than said attractive force; and

resetting means responsive to closing of said shutter for resetting said locking means to its operative position against the biasing force of said biasing means.

4,132,475

SHEET ADVANCING AND POSITIONING DEVICE

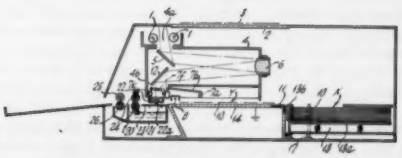
Tomio Suzuki, Aichi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

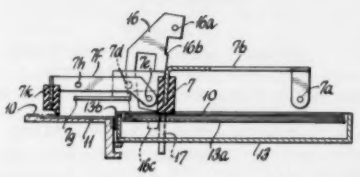
Filed Jul. 14, 1977, Ser. No. 815,741

Claims priority, application Japan, Jul. 23, 1976, 51-97602[U]

Int. Cl.² G03G *15/00*

U.S. Cl. 355—3 R **14 Claims**





1. An apparatus for advancing a web along a predetermined path and stopping it in a predetermined position comprising:

a transport means for advancing a web along a predetermined path under the influence of a transporting force;

an electrically insulating member positioned on said path;

charging means for charging said insulating member prior to the passing of said web over the insulating member by said transport means; and

releasing means for releasing said transporting force from being transmitted to said web prior to the passing of the trailing edge of said web over the insulating member charged by said charging means, whereby said web advancing along said path is forcibly stopped in said prede-

termined position due to the electrostatic attracting force between said charged insulating member and said web.

4,132,476
ELECTRO-PHOTOGRAPHIC COPIER WITH ANTI-SPILL ARRANGEMENT

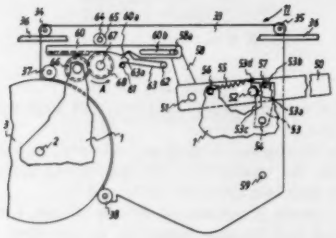
Günter Wetzel, Haar, Fed. Rep. of Germany, assignor to AGFA-GEVAERT AG, Leverkusen, Fed. Rep. of Germany

Filed Jul. 6, 1976, Ser. No. 702,863

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1975, 2529835

Int. Cl.[2] G03G *15/08*

U.S. Cl. 355—3 DD **9 Claims**



1. An electro-photographic copier, comprising a carrier having a surface on which an electrostatic latent image is formed; a developing unit for said image, comprising a housing and an endless conveyor mounted in said housing for movement in a direction so as to cascade developer material over said surface to thereby develop said latent image, said conveyor comprising a gear which normally advances in a sense moving said conveyor in said direction; mounting means mounting said unit for movement between an operating position adjacent to and a retracted position spaced from said carrier, operating means for locking said unit in said operating position and for unlocking the unit in preparation for movement to said retracted position; and motion-transmitting means operatively connected with said conveyor and said operating means for imparting to said conveyor an increment of movement counter to said direction in response to actuation of said operating means for unlocking said unit, said motion-transmitting means comprising a rack which engages said gear and entrains it counter to said sense in response to unlocking of said unit, said rack having a row of teeth and the length of sand row being such that said teeth are disengaged from said gear when said unit is locked.

4,132,477
OPTICAL IMAGING SYSTEM FOR ELECTROPHOTOGRAPHY

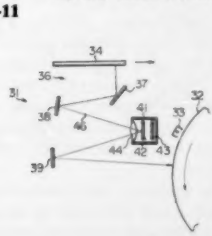
Rokuro Watabe; Makoto Ohira, and Katsuo Sakai, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 23, 1976, Ser. No. 754,045

Claims priority, application Japan, Dec. 27, 1975, 50-177411[U]

Int. Cl.[2] G03G *15/00*

U.S. Cl. 355—11 **8 Claims**



1. In an electrophotographic apparatus including a photoconductive member and a converging lens for projecting a light image of an original document along an optical path onto the photoconductive member, a dichroic mirror disposed in the optical path for reflecting the light image and having a reflectance characteristic selected in accordance with the spectral sensitivity of the photoconductive member, the dichroic mirror comprising a transparent plate formed with a dichroic front reflecting surface and a back diffusing surface, and a light absorbing member disposed adjacent to the back surface layer of the dichroic mirror.

4,132,478
ILLUMINATION SYSTEM FOR A PHOTOGRAPHIC COPYING APPARATUS

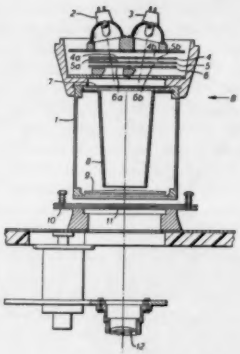
John G. Long, Epsom, and Nicholas P. Watts, Horley, both of England, assignors to Durst (U.K.) Limited, Epsom, England

Filed Jul. 6, 1977, Ser. No. 813,269

Claims priority, application United Kingdom, Jul. 26, 1976, 31057/76

Int. Cl.[2] G03B *27/54, 27/76*

U.S. Cl. 355—71 **13 Claims**



1. A light diffuser for a light projecting apparatus having a light source comprising a plurality of elongated lens elements of substantially uniform cross section, a holder for the lens elements disposing them in close contact with each other in a parallel row of transverse disposition in the projected light to diffuse it, and the lens elements each comprise an individual rigid rod whereby the resistance to thermal stress is improved.

4,132,479
PATTERN TRANSFER OPTICAL SYSTEM

Georges Dubroeucq, and Michael Lacombat, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Dec. 7, 1977, Ser. No. 858,402

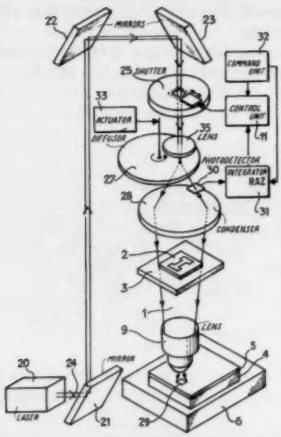
Claims priority, application France, Dec. 10, 1976, 76 37327

Int. Cl.[2] G03B *27/76*

U.S. Cl. 355—71 **17 Claims**

1. A pattern transfer optical system for forming onto a support coated with a layer of photosensitive material an image of a pattern carried by an object of non uniform transparency, said system comprising illumination means illuminating said object for supplying an exposure of predetermined duration; said illumination means comprising a source of coherent light and optical modulation means; said optical modulation means comprising a moving element imparting to the luminous radia-

tion transmitted from said source to said object wavefront fluctuations of short duration as compared to said duration,



thereby averaging unwanted fringe patterns created in said layer by said coherent light.

4,132,480

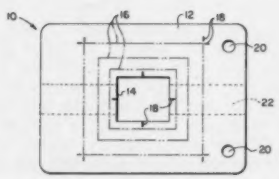
PHOTOGRAPHIC MASK STRUCTURE

Robert A. Reed, 1484 S. Ward St., Lakewood, Colo. 80228

Filed Jul. 5, 1977, Ser. No. 812,553

Int. Cl.[2] G03B *27/62*

U.S. Cl. 355—75 **9 Claims**



7. A cropping mask for photographic transparent film comprising, a card in sheet form of a paper board material having defined therein a plurality of score lines in the form of subtantially concentric, rectilinear configurations having a common center of area, and indexing means defined in the card at a position spaced from the confines of the score lines.

4,132,481

CROSS-TALK BALANCING CIRCUIT FOR SPECTROPHOTOMETERS

Michael A. Ford, Maidenhead, and David Jackson, H. Wycombe, both of England, assignors to Perkin-Elmer Limited, Beaconsfield, Great Britain

Filed Dec. 27, 1976, Ser. No. 754,862

Claims priority, application United Kingdom, Dec. 30, 1975, 53086/75

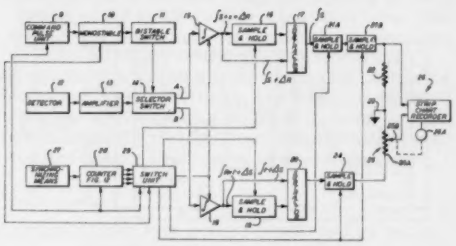
Int. Cl.[2] G01J *3/42*

U.S. Cl. 356—325 **16 Claims**

1. In an apparatus comprising signal generating means for producing at a given generation frequency subject to spurious fluctuations an electrical signal having a component varying in response to a first quantity and a component varying in response to a second quantity, the signal transfer characteristic of said generating means being such as to cause cross-talk between the two components, the combination of:

(a) demodulation means referenced to said signal generating means for switching each component into its own demodulation channel;

(b) phasing means forming part of said demodulation means for adjusting the timing of the demodulation switching referred to said generation frequency so as to separate the two components while substantially establishing cross-talk balance in each of the two demodulation channels; and



(c) means co-operating with said demodulation means to retard or advance the timing of demodulation switching in the presence of a spurious increase or a decrease, respectively, of the generation frequency, the amount of retard or advance being related to the amplitude of the frequency change, whereby cross-talk balance as set at a datum generation frequency is substantially maintained despite the presence of said fluctuations.

4,132,482

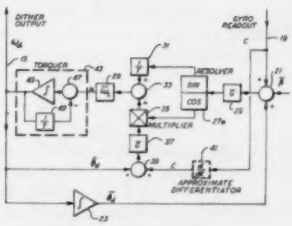
FEEDBACK SYSTEM FOR A RING LASER GYRO

Bernard Friedland, West Orange, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed Sep. 12, 1977, Ser. No. 832,053

Int. Cl.[2] G01B *9/02;* **G06G** *7/48*

U.S. Cl. 356—350 **12 Claims**



1. In combination with a ring laser gyro adapted to provide a gyro readout proportional to an angular input rate, an improved dither generator comprising a feedback dither generator having as an input the gyro readout and providing as an output a dither rate for dithering the gyro, said feedback dither generator adapted to generate a dither rate which is essentially equal to the lock-in characteristic of the gyro.

4,132,483

MOLDING MACHINE WITH PROPORTIONAL DISPENSING

Mathew A. Slaats; David E. Overton, and James E. Blessinger, all of Jasper, Ind., assignors to Kimball International, Inc., Jasper, Ind.

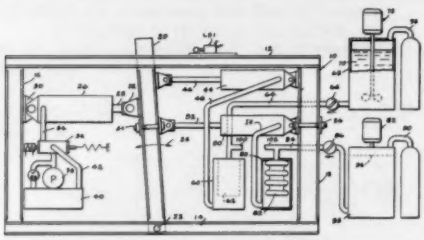
Continuation of Ser. No. 541,732, Jan. 17, 1975, abandoned. This application Jan. 6, 1977, Ser. No. 757,388

Int. Cl.[2] B01F *15/04*

U.S. Cl. 366—162 **7 Claims**

1. In a molding machine for supplying molding materials to a mold cavity, the improvement being a mixing apparatus

comprising: a body with a mixing chamber formed therein and having an outlet adapted for connection to a mold cavity, at least two check valves having outlet means disposed in opposed relation to said chamber whereby streams of liquid molding material discharged therefrom will impinge upon one another in said mixing chamber, molding material supply means for supplying relatively measured amounts of respective



molding materials simultaneously to the inlets of said check valves under pressure, and resilient means biasing said check valves toward closed positions with a force such that the pressure on the materials required to open said valves is of such magnitude that high velocity jets of the materials will emerge from the check valves into the mixing chamber and impinge on one another and promote intimate mixing of the materials in said mixing chamber.

4,132,484

MIXER, PARTICULARLY HEATING-COOLING MIXER FOR CHEMICAL PROCESSES

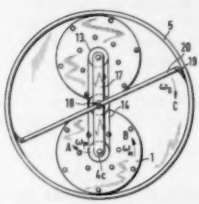
Hans Kimmel, Bielefelder Strasse 445A, 493 Detmold 18, Germany

Continuation-in-part of Ser. No. 580,285, May 23, 1975. This application Dec. 23, 1976, Ser. No. 753,874

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1975, 2559175; Dec. 30, 1975, 2559176; Jun. 11, 1974, 2428153

Int. Cl.[2] B01F *7/30*

U.S. Cl. 366—288 **5 Claims**



1. A mixer comprising: a mix container, the interior of which is essentially symmetrical about a vertical axis; at least one rotatably symmetrical mixing element having a carrier plate and a plurality of mixing rods carried thereby and parallel to the axis of the mixing element, said mixing element being laterally offset from the axis of the mixing container and its axis forming an angle α with the axis of the container; the carrier plate being perpendicular to the axis of the element and the length of the rods being such that the rods extend adjacent to the walls and floor of the mix container; a drive shaft extending up through and coaxial with the container; a linkage assembly means rotatably connecting the element to said drive shaft; said linkage assembly means causing the mixing element to rotate in accordance with the relation $\omega_P \cdot \cos \alpha = \omega_M$ where ω_P is the angular velocity of the element about the container axis and ω_M is the angular velocity of the element about its own axis, and the direction of rotation of the element about the container axis is opposite to the direction of rotation of the element about its own axis.

4,132,485

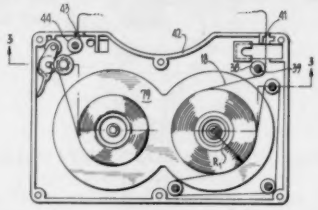
INK RIBBON CARTRIDGE WITH CONSTANT TENSION MECHANISM

Ernst P. Hess, Castro Valley, Calif., assignor to Qume Corporation, Hayward, Calif.

Continuation of Ser. No. 449,131, Mar. 7, 1974, abandoned. This application Aug. 11, 1975, Ser. No. 603,411

Int. Cl.[2] B41J *33/04*

U.S. Cl. 400—208 **13 Claims**



1. A cartridge for supplying an inked ribbon to a printing station in an associated printing apparatus, said cartridge comprising:

a housing having a ribbon entrance and a ribbon exit;

a first reel rotatably mounted above a fixed axis in said housing for providing a supply core for an inked ribbon adapted to be wrapped thereabout;

a second reel rotatably mounted in said housing for providing a take-up core for an inked ribbon adapted to be wrapped thereabout;

ribbon transport means positioned adjacent said ribbon entrance for providing a force for translating said ribbon from said first reel to said second reel via said exit and said entrance; and

means adjacent said first reel for providing a drag force on said first reel to maintain the tension in said rubber substantially uniform in said printing station substantially independently of the quantity of ribbon on said supply core; said drag force means comprising a plurality of freely rotatable idler members defining a belt path, and an elastic belt disposed about said idler members along said path for translation therealong, a portion of said path defining an interference region in which the surface of a portion of said belt located therein engages the outer layer of supply core mounted ribbon encountered therein so that said belt is deflected thereby.

4,132,486

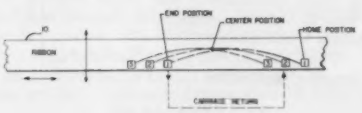
RIBBON PLATFORM MECHANISM FOR EXTENDING RIBBON LIFE

Okun Kwan, Trumbull, Conn., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Jan. 5, 1977, Ser. No. 757,130

Int. Cl.[2] B41J *33/58*

U.S. Cl. 400—213 **13 Claims**



1. A ribbon mechanism, for printers having a movable printhead, which equalizes print density and extends the useful life of a ribbon, comprising:

a platform movable bidirectionally;

a length of printing ribbon extending along a third direction perpendicular to the bidirectional movement of the platform for receiving character impacts from the pinthead as the printhead traverses a section of said ribbon;

means for moving the platform bidirectionally as the printhead traverses the ribbon, and causing the printhead to effect an arcuate printing pattern across the ribbon each time the printhead traverses the ribbon length; and

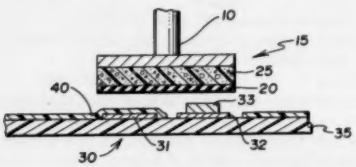
means cooperating with the ribbon for incrementing movement thereof, after each traversal of a ribbon length by the printhead, and causing successive printing patterns to overlap, thus utilizing substantially all of the printable area of the ribbon.

4,132,487

KEYBOARD SWITCH

Robert P. Fisher, St. Paul, Minn., assignor to Maxi-Switch Company, Minneapolis, Minn.

Filed May 16, 1977, Ser. No. 796,864
Int. Cl.[2] B41J 5/08
U.S. Cl. 400—479.1 **5 Claims**



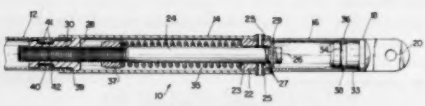
1. A push button transducer comprising, a reciprocal member, a resilient compressible foam pad positioned on one end of the reciprocal member, a conductive elastomer member mounted on said resilient pad, a pair of conductor elements separated by a gap and mounted on one side of a fixed member, a covering of dielectric material positioned over one of said conductor elements, and means for reciprocating the reciprocal member into bridging contact with said dielectric covered conductor element and said other conductor element to vary the resistance and capacitance coupling between the conductor elements, said one conductor element with the dielectric covering thereon having a thickness dimension less than a thickness dimension of the other conductor element to permit contact of the elastomer member with the other conductor element before the elastomer member contacts the dielectric covering.

4,132,488

COMPRESSIBLE BOW ADJUSTER

Howard D. Strong, 119 Chardon Ave., Chardon, Ohio 44024

Filed May 16, 1978, Ser. No. 906,628
Int. Cl.[2] F16B 7/06
U.S. Cl. 403—60 **5 Claims**



1. An adjuster for adjusting the length of a bow comprising:

an elongate threaded rod;

a cylindrical sleeve;

means for mounting said sleeve on said rod with said sleeve extending coaxially about said threaded rod, said mounting means including a first bushing having a bore slidably receiving said threaded rod, a pin through one end of said threaded rod having a length greater than the diameter of the bore, said pin engaging one end of the bushing, a spring member coaxially mounted on said threaded rod engaging the opposite end of said first bushing and biasing said threaded rod to urge said pin into engagement with said first bushing, said first bushing being fixedly attached to a first end of said sleeve;

swivel bracket means rotatably mounted on said sleeve, the axis of rotation of said bracket means being colinear with the longitudinal axis of said elongated threaded rod;

a second bushing having a threaded bore that receives said threaded rod, said second bushing attached to the end of a bow, the end of the bow being telescopically received within a second end of the sleeve, said sleeve being rotatable so that said second bushing progresses along said threaded rod relative to said mounting means; and

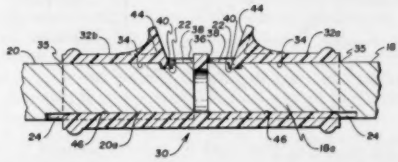
whereby the bow length may be adjusted by rotating the sleeve and whereby the bow length may be shortened upon the application of a sufficient force on the bow which causes said elongate threaded rod to slide through said first bushing as said spring member is compressed.

4,132,489

COUPLING UNIT FOR CONNECTING POLES IN AN END-TO-END RELATIONSHIP

Albert T. Berg, Jr., and Howard Langlie, both of Ellendale, Minn. 56026

Filed Sep. 9, 1977, Ser. No. 831,940
Int. Cl.[2] F16B 7/00
U.S. Cl. 403—305 **3 Claims**



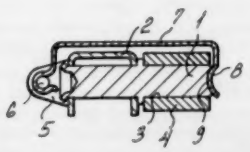
1. A coupling unit comprising a tubular body portion provided with an opening, a resilient tongue, a latch member mounted on the free end of said tongue and extending angularly through said opening into the bore of said tubular body portion, a longitudinal key projecting into said bore from said tubular body portion, and a plurality of longitudinal sawtooth splines projecting into said bore from said tubular body portion, said key projecting farther into said bore than said splines.

4,132,490

DEVICE FOR SECURING A WIPER BLADE TO AN ARM

Maurice A. Journée, Reilly, France, assignor to Paul Journée, S.A., Courbevoie, France

Division of Ser. No. 711,917, Aug. 5, 1976. This application Oct. 3, 1977, Ser. No. 839,092
Claims priority, application France, Jun. 7, 1975, 75 28302
Int. Cl.[2] B25G 3/00
U.S. Cl. 403—316 **1 Claim**



1. A device for mounting a windscreen wiper blade on a pivotal arm comprising a pin fixedly secured to and projecting from one of said blade and arm, a pin receiving opening in the other of said blade and arm, said pin being provided with releasable locking means adapted to cooperate with the end of said pin receiving opening opposite to the end through which said pin is introduced into that opening and operable to secure said arm and blade together and to release said arm and blade

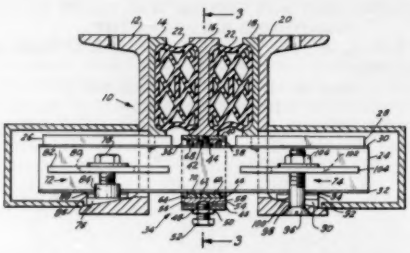
and wherein the bore receiving the pin has an inner shoulder, said pin carries radially projecting elastic arms, the ends of which cooperate with said shoulder, a spring-biased push-member being axially slidable on the end of said pin and having a cylindrical skirt portion which cooperates with said arms so as to withdraw the arms in the course of the displacement of said push-member, said arms and push-member constituting said locking means.

4,132,491

RESTRAINT ASSEMBLY FOR BRIDGE ROADWAY EXPANSION JOINTS

Carl W. Scheffel, Ellicott City, Md., assignor to Fox Industries, Inc., Baltimore, Md.

Filed Apr. 27, 1978, Ser. No. 900,710
Int. Cl.[2] E01C *11/02*
U.S. Cl. 404—68 **9 Claims**



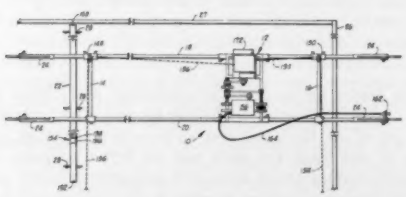
1. An expansion joint used to connect sections of bridge roadway comprising a pair of parallel spaced apart side channels which run substantially the width of a roadway, a center channel disposed between said parallel channels, a pair of seals disposed, one each between said side channels and said center channel, at least one support bar disposed transversely to said channels, hold-down means connecting said side channels and said support bar, and restraint assembly means connecting said support bar and said center channel, said restraint assembly means including a restraint member connected to said center channel and having portions extending above and below said support bar, an upper resilient pad disposed above said support bar between said support bar and said restraint member, and a lower resilient pad disposed below said support bar between said support bar and said restraint member permitting relative motion between said support bar and said center channel thereby eliminating unwanted noise while allowing movement necessary for expansion and contraction of said expansion joint.

4,132,492

CONCRETE SCREED MACHINE

George P. Jenkins, P.O. Box 41, Geuda Springs, Kans. 67051

Filed Feb. 13, 1978, Ser. No. 876,903
Int. Cl.[2] E01C *19/22*
U.S. Cl. 404—119 **16 Claims**



9. A concrete screed machine comprising:

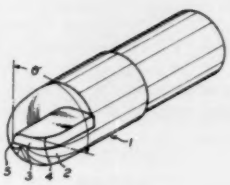
a main frame for mounting upon a pair of substantially parallel screed boards;
a prime mover mounted upon the frame;
an idler shaft mounted upon the frame;
first drive means connecting the prime mover and the idler shaft;
a vibrator shaft mounted upon the frame;
second drive means connecting the vibrator shaft and the idler shaft;
an eccentric weight attached to the vibrator shaft;
a gear box having an input shaft and an output shaft;
third drive means connecting the input shaft and the idler shaft;
a winch means mounted upon the frame;
a coupling, for connecting the winch means and the output shaft, said coupling including a shear pin for permitting automatic disengagement of the output shaft and the winch means if the winch means is restrained from rotating;
a level wind shaft mounted upon the frame;
fourth drive means connecting the winch means and the level wind shaft;
cable means for engaging the winch means; and
a level wind means engaging the level wind shaft for providing a reciprocal guiding motion of the cable means across the winch means so that said cable means is received on the winch means is a series of concentric layers comprised of multiple side by side wraps of the cable means.

4,132,493

BALL END MILL

Ryosuke Hosoi, 5-9-10, Kami-minami, Hirano-ku, Osaka, Japan

Filed Feb. 15, 1977, Ser. No. 768,924
Claims priority, application Japan, Sep. 2, 1976, 51-105639
Int. Cl.[2] B23C *5/02, 5/10*
U.S. Cl. 407—53 **9 Claims**



1. A toothed ball end mill comprising a shank having a ball end, a tooth projecting axially of said shank having a cutting edge formed thereon, said cutting edge including a starting end located adjacent the longitudinal axis of said shank and extending along a line which curves radially outwardly in the direction of rotation of the end mill and having its greatest curvature proximate the central portion of the end mill, said curved line of the cutting edge progressively increasing in curvature from an outer peripheral portion of the end mill toward the center portion thereof.

4,132,494

ALIGN BORING MACHINE

Rufus W. Aldridge, Jr., 10022 Nadina Dr., Huntsville, Ala. 35803

Filed Feb. 8, 1978, Ser. No. 875,985
Int. Cl.[2] B23B *41/12*
U.S. Cl. 408—54 **3 Claims**

1. A boring machine for alignment boring of a plurality of bearing housings of an automotive engine block comprising:
a horizontally elongated base having vertical and horizontal longitudinally extending machine ways;
a first vertical adjustable-in-height column supported by one end region of said elongated base and in engagement and

aligned with said machine ways, and a second vertical adjustable-in-height column supported on an opposite end region of said elongated base and in engagement and aligned with said machine ways;

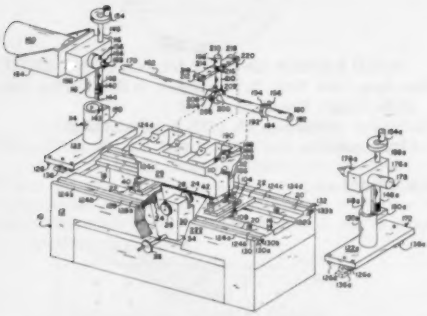
an elongated horizontal track on said base between said vertically extending columns, which track defines a longitudinal axis and horizontally reference plane in alignment with said vertical and horizontal machine ways;

a table adapted to be supported by and be longitudinally movable along said track;

feed means for selectively moving said table along said track;

a boring bar;

bearing support means for horizontally and rotably supporting ends of said boring bar on and between said columns



and along a line in a first plane parallel with the plane of said vertical machine ways and coincident in a second plane parallel with the plane of said vertical machine ways;

drive means coupled to one end of said boring bar for rotating said boring bar;

engine block support means for adjustably, vertically and laterally, and rigidly supporting an engine block on said table with said boring bar through bearing housings with said bar concentrically positioned with respect to the center of a desired bore through said bearing housings; and

at least one cutting tool mounted on said boring bar, whereby bearing housings of an engine block may be bored by moving said table longitudinally by operation of said feed means.

4,132,495

DIE HEAD WITH WORKPIECE ACTUATED RELEASE

Gerhard Baumann; Hans Tanner, both of Schaffhausen, and Xaver Wuchner, Jestetten, all of Switzerland, assignors to Georg Fischer Aktiengesellschaft, Switzerland

Filed Oct. 31, 1977, Ser. No. 846,822

Claims priority, application Switzerland, Nov. 4, 1976, 13894/76

Int. Cl.[2] B23B *39/00*; B23G *1/00*

U.S. Cl. 408—74 **9 Claims**

1. A die head having replaceable threading dies comprising the combination of

a die carrier comprising a generally cylindrical body having a hollow interior and a central axis, a plurality of projections extending axially from one end of said body and means defining a generally radially extending slot in each of said projections;

a plurality of threading dies, each of said dies being radially slidable in one of said slots, said dies having inwardly facing thread forming surfaces defining a cavity to receive a workpiece;

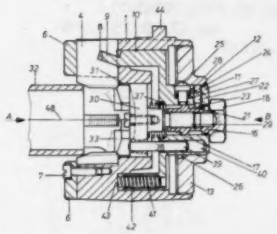
a cover plate on each of said projections;

means in each of said threading dies for defining a cam slot opening generally away from said cover plate;

a bearing flange axially adjustably mounted in the other end of said body, said bearing flange having a central opening therethrough;

a cam bushing in said carrier having a plurality of cams enaging said slots in said threading dies, said cam bushing being axially shiftable relative to said body and having a reduced diameter portion extending into said opening in said bearing flange;

means defining a central bore in said reduced diameter portion of said busing;



a control pin in said central bore, said pin being axially adjustable and lockable against movement therein;

a sensor bolt coupled to said control pin;

a flange on said bolt; and

stop cam means on said flange and facing said cavity, said stop cam means having a conical surface contactable by the workpiece for axially moving said flange, said sensor bolt, said control pin and said bushing when contacted and moved by the workpiece, thereby moving said threading dies radially outwardly.

4,132,496

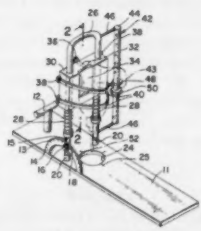
PRECISE ANGLE DRILLING ATTACHMENT

John W. Casto, 2506 N. 20th Rd. #402, Arlington, Va. 22201

Filed Jul. 8, 1976, Ser. No. 703,432

Int. Cl.[2] B23B *45/14*

U.S. Cl. 408—112 **2 Claims**



1. An angle drilling attachment for use with a portable rotary tool, such as an electric drill, comprising a base to which is orthogonally attached a sector marked with positional indicia, and two blocks which hingedly mount a one piece U-shaped ways upon which is movably mounted a sliding frame having a nest into which is fitted one of a plurality of different interchangeable contour blocks wherein a portable rotary tool is fitted against a contour block, means for adjusting the contour block relative to the nest of the sliding frame for fitting the contour block to the contour of the portable rotary tool, and which frame mounts rotary tool retaining means; and which ways mounts spring returning means for the frame; and indicating means mounted on the slidable frame relative to the sector and retaining means mounted on the sector; frame displacement indicating means including a threaded graduated length

bar attached to the one piece U-shaped ways having an indicator attached to the sliding frame which indicates position on the bar and movable stop means for limiting the movement of the sliding frame in the direction of the base.

4,132,497

DRILLING MACHINES AND GUARDS THEREFOR

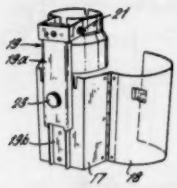
Stanley T. Weller, 14 Sutherland Grove, Southfields, London, SW18; Peter K. Weller, 11 Pepys Rd., Raynes Park, London, SW20, and Michael A. Weller, 54 Ferrers Rd., Streatham, London, SW16, all of England

Filed Jul. 21, 1977, Ser. No. 817,858

Claims priority, application United Kingdom, Jul. 23, 1976, 30853/76; Mar. 15, 1977, 10983/77

Int. Cl.[2] B23B *47/00*

U.S. Cl. 408—241 G **16 Claims**



1. A guard for protecting an operator from the rotating parts of machines and suspended from a non-rotating support member adapted to be moved relatively toward and from a workpiece, comprising:

a protecting member adapted to be attached to said non-rotating support member and extending therefrom;

a multi-part shield overlapping at least a portion of said protecting member and including a shield portion movable to enable access to said rotating parts in an inoperative condition;

a slide member mounted between, and on the outer peripheries of, said protecting member and said multi-part shield, and extending along an axis substantially parallel to the axis of movement of said non-rotating support member, at least one part of said shield being movable along said slide member; and

said shield having a larger outer peripheral dimension than the outer peripheral dimension of said protecting member, and said at least one part of said shield being movable to enable access to said rotating parts by manual operation of said shield portion with the non-rotating support member retracted from the workpiece, and said shield being movable to engage the workpiece and substantially enclose said rotating parts with said non-rotating member extended toward said workpiece.

4,132,498

EARTH ANCHOR AND METHOD OF SETTING AND REMOVING SAME

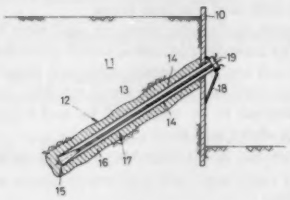
Isamu Ikeda, Yokohama, Japan, and Kunimitsu Yamada, 19-7, Tsurumaki 3, Setagaya-ku, Tokyo, Japan, assignors to Shigeru Sugimura and Kunimitsu Yamada, both of Tokyo, Japan

Filed Feb. 14, 1978, Ser. No. 877,695

Int. Cl.[2] E02D *5/74*

U.S. Cl. 61—39 **30 Claims**

1. For use in an earth bore-hole to be encased in a shroud of frangible low strength hardenable material to anchor an excavation site structure, a shroud breaking earth anchor comprising: a cone-shaped anchor-wedge; a cable fastening collar; a central tie-back cable secured at one end to said anchor-wedge and at its other end to said cable fastening collar, means encasing said central tie-back cable against seepage of said frangible hardenable material between said anchor-wedge and said cable fastening collar, said cable fastening collar being securable to the excavation site structure to be anchored; and means to tension said tie-back cable sufficiently to draw said anchor-



wedge into breaking engagement with said frangible hardenable material subsequent to hardening.

4,132,499

WIND DRIVEN ENERGY GENERATING DEVICE

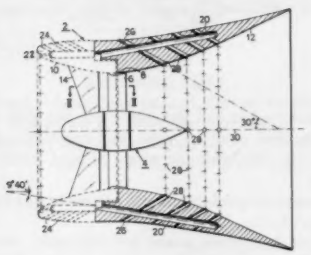
Ozer Igra, New York, N.Y., assignor to Ben Gurion University of the Negev, Beersheba, Israel

Filed Jan. 25, 1977, Ser. No. 762,277

Claims priority, application Israel, Jan. 29, 1976, 48928

Int. Cl.[2] F03D *17/00*

U.S. Cl. 415—2 **9 Claims**



1. A wind-driven energy-generating device comprising: a turbine including wind-driven rotor blades; and a shroud enclosing same; said shroud including a throat within which the wind-driven rotor blades are mounted for rotation, an intake section upstream of and having an inner face converging towards the throat, a diffuser section downstream of and having an inner face diverging away from the throat, and boundary layer control means to prevent premature air separation along the inner surface of the diffuser section; said boundary layer control means including a plurality of air channels formed through the shroud leading from an external surface of the shroud to the internal surface of its diffuser section for injecting a flow of air of high kinetic energy from the airstream external of the shroud to the boundary layer of the airstream within the diffuser section of the shroud.

4,132,500

CONTROLLABLE AND PROGRAMMABLE FLUID FLOW MODULATION SYSTEM

Kenneth R. Reader, Monrovia, and Joseph B. Wilkerson, Damascus, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 18, 1977, Ser. No. 798,068

Int. Cl.[2] B64C *21/08*

U.S. Cl. 416—20 R **25 Claims**

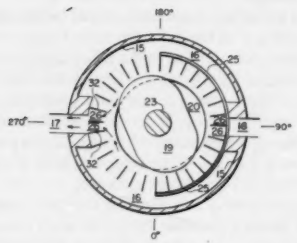
1. A valve comprising:

a plenum chamber having an interior cylindrical surface;

inlet means for directing the flow of pressurized fluid into the plenum chamber;

outlet means for directing the flow of pressurized fluid out of the plenum chamber;

cam means for modulating the flow of pressurized fluid through said plenum chamber between said inlet means and said outlet means, the cam means including at least one cam positioned within the space enclosed by the cylindrical surface of said plenum chamber;



programming means for turning on and off the modulated flow of pressurized fluid through said outlet means and controlling the direction of fluid flow between said cam means and said outlet means, said programming means being located between said outlet means and said cam, and said outlet means being rotatable relative to said cam and said programming means.

4,132,501

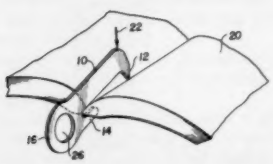
TELEPHONE BOOK HANGER

Paul R. Simpson, 1718 Willow Creek Rd., Prescott, Ariz. 86301

Filed Nov. 4, 1977, Ser. No. 848,681

Int. Cl.[2] B42D *17/00*

U.S. Cl. 281—15 A **5 Claims**



1. A hanger for a telephone book or the like, said hanger comprising:

(a) an elongated body;

(b) a pointed ear projecting from said elongated body transversely to its length;

(c) a holding dog carried by said elongated body and defining therewith a recess parallel to the length of said elongated body on the same side of said elongated body as said pointed ear, said recess being open towards said pointed ear and spaced therefrom; and

(d) means for suspending said elongated body.

4,132,502

SPATULA FOR MIXING PLASTIC SUBSTANCES

Klaus Bunke, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

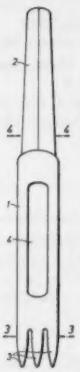
Filed May 19, 1977, Ser. No. 798,743

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1976, 2625920

Int. Cl.[2] B01L *3/18;* A47J *43/28*

U.S. Cl. 416—70 R **6 Claims**

1. Spatula for mixing plastic substances such as for dental purposes or the like, comprising: an elongated knife-blade portion symmetrical about its longitudinal axis and strengthened along its entire longitudinal length such that the cross-section forms a flat lozenge which becomes flatter and narrower towards one end thereof; an elongated handle unit connected at one end to the other end of the knike blade portion wherein the handle unit is substantially flat and has a given width; and an implement having fork-like spikes which lie adjacent to each other and disposed at the other end of the



handle unit and having substantially the same width, wherein the implement has an essentially shorter section in the longitudinal direction than the knife-blade portion, so that the handle unit is displaced from the linear center of the spatula toward the implement; wherein the knife blade portion and the implement are disposed on either side of the handle unit to define a substantially flat elongated spatula.

4,132,503

VARIABLE-PITCH PROPELLER

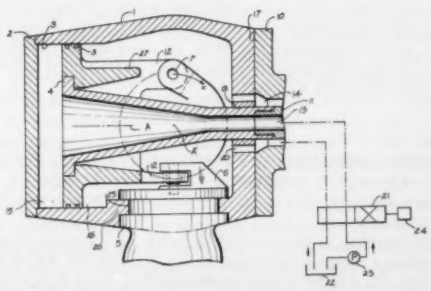
Robert Kreft, Stockelsdorf, and Udo Törper, Lübeck, both of Fed. Rep. of Germany, assignors to Schaffran Propeller Lehne & Co., Lübeck, Fed. Rep. of Germany

Filed Mar. 25, 1977, Ser. No. 781,081

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1976, 2613225

Int. Cl.[2] B63H *3/04*

U.S. Cl. 416—167 **14 Claims**



1. A variable-pitch propeller comprising:

a hollow hub rotatable about a hub axis; at least one vane arranged on said hub and rotatable on said hub about a vane axis extending generally radially of said hub axis; a pivot fixed on said vane and defining a pivot axis off-set from and generally parallel to said vane axis; an adjustment member arranged in said hub for displacement parallel to said hub axis and for rotation in said hub about said hub axis; a link extending generally along said hub axis and having two ends one of which is rigidly secured to said adjustment member; self-aligning bearing means slidably supported on said pivot and joining for swivel movement

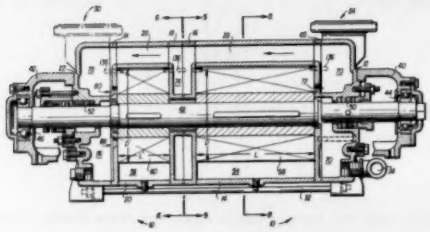
the other end of said link to said pivot to transform axial displacement and rotation of said hub into a rotary movement of said vane about said vane axis; and means for axially displacing and simultaneously rotating said adjustment member in said hub along and about said hub axis and thereby rotating said vane about said vane axis.

4,132,504

LIQUID RING PUMP

James B. Fitch, Marshfield, Mass., assignor to General Signal Corporation, Rochester, N.Y.

Filed Apr. 7, 1976, Ser. No. 674,707
Int. Cl.[2] F04C *19/00*
U.S. Cl. 417—68 **12 Claims**



1. A liquid ring pump for gases, liquids and mixtures thereof, comprising:

a casing;

a first impeller mounted for rotation within said casing, said first impeller having radial displacement chambers, a diameter and an axial length, the ratio of said axial length to said diameter being greater than 1.06;

a second impeller mounted for rotation within said casing;

at least one first stage suction port located adjacent each end of said first impeller;

at least one second stage suction port located adjacent each end of said second impeller;

at last one first stage discharge port from said first impeller; and

a first stage center plate and a second stage center plate comprising part of said casing and being mounted between said impellers, said plates defining a volume therebetween, said volume being separated into a first suction plenum for directing fluid to said at least one first stage suction port and a second suction plenum for directing fluid from said at least one first stage discharge port to said at least one second stage suction port.

4,132,505

THERMOCOMPRESSOR UTILIZING A FREE PISTON COASTING BETWEEN REBOUND CHAMBERS

Mark Schuman, 101 G St., SW., Apt. 516, Washington, D.C. 20024

Continuation of Ser. No. 718,162, Aug. 27, 1976, abandoned, which is a continuation-in-part of Ser. No. 592,895, Jul. 3, 1975, Pat. No. 4,012,910. This application Sep. 2, 1977, Ser. No. 830,140
Int. Cl.[2] F04B *19/24*
U.S. Cl. 417—207 **81 Claims**

1. A thermocompressor comprising:

a cylinder fitted with a free piston sized to form a sliding seal with the cylinder as the piston oscillates between and separates hot and cold ends of the cylinder;

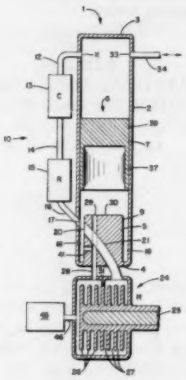
a cylinder bypass bypassing a portion of the cylinder so as to allow a compressible fluid to alternately flow back and forth between said hot and cold ends of the cylinder as the piston moves in alternate directions between said cylinder ends;

means for cooling the fluid flowing into the cold cylinder end and for heating the fluid flowing into the hot cylinder end thereby producing a cyclical fluid pressure variation utilizable for driving a load;

said heating means including a heating chamber disposed outside of the bypass and communicating with the hot end of the cylinder via a heating chamber inlet conduit, said inlet conduit communicating with the hot end of the cylinder via a heating chamber inlet port defined in the hot end of the cylinder;

said bypass including, in seriatim, a cold bypass port defined in said cold end of the cylinder, a hot bypass conduit, and a hot bypass port defined in the sidewall of the cylinder in said hot end of the cylinder, whereby the fluid exiting the hot end of the bypass via said hot bypass port flows into the hot end of the cylinder in a substantially defined stream during a first portion of the ocillatory cycle while the piston is moving in the bypass region of the cylinder toward the cold end of the cylinder;

means for positioning and aligning said hot bypass conduit and said heating chamber inlet port with respect to each other and with respect to the hot end of the cylinder so as to augment passage of said fluid in said stream into said



heating chamber via said inlet port and said inlet conduit for heating fluid in the heating chamber during said first portion of the cycle;

said piston during a hot rebound portion of the oscillatory cycle blocking said hot bypass port and compressing and forcing fluid from the hot end of the cylinder into said heating chamber for heating therein for expanding and driving said piston toward the cold cylinder end with a greater piston kinetic energy at the end of the hot rebound cycle portion than the kinetic energy of the piston at the beginning of the hot rebound cycle portion; and

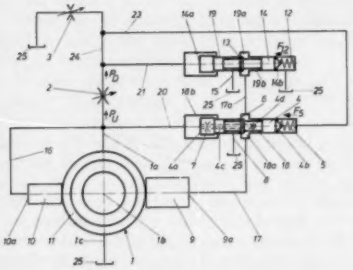
means for reversing the piston motion at the cold cylinder end,

said positioning and aligning means including means for positioning the heating chamber inlet port within the hot end of the cylinder at a location such that its distance from the hot bypass port is a small fraction of the diameter of the cylinder, whereby said passage of fluid in said stream into said heating chamber is further augmented, thereby augmenting said heating of fluid during said first portion of the cycle.

4,132,506
PRESSURE AND VOLUME-FLOW CONTROL FOR VARIABLE PUMP

Jorg Dantlgraber, Lohr, Fed. Rep. of Germany, assignor to G.L. Rexroth G.m.b.H., Lohr, Fed. Rep. of Germany

Filed Nov. 12, 1976, Ser. No. 741,460
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1975, 2551088
Int. Cl.² F04B *49/00*
U.S. Cl. 417—218 **8 Claims**



1. A method of controlling a source of fluid pressure having an output connected via a fluid path to a load and having a control port whose pressurization determines and is generally proportional to the pressure at said output, said method comprising the steps of:

(a) restricting flow at a location along said path;

(b) substantially continuously returning some of said fluid from said path through a restriction to said control port and pressurizing same therewith;

(c) sensing pressure in said path upstream of said location and generating an upstream pressure signal corresponding thereto;

(d) sensing pressure in said path between said location and said load and generating a downstream pressure signal corresponding thereto;

(e) comparing said upstream and downstream signals and generating a difference signal corresponding to the difference therebetween;

(f) comparing said difference signal with a predetermined first set point and depressurizing said control port at least partially when said difference signal exceeds said first set point; and

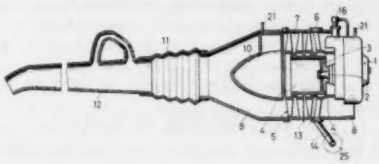
(g) comparing said downstream signal with a second set point and depressurizing said control port at least partially when said downstream signal exceeds said second set point.

4,132,507
BLOWING APPARATUS

Satoshi Akiyama, and Michio Shikutani, both of Odawara, Japan, assignors to Kabushiki Kaisha Shikutani, Odawara, Japan

Filed Nov. 23, 1977, Ser. No. 854,211
Claims priority, application Japan, Jul. 13, 1977, 52-083013
Int. Cl.² F04B *21/00, 17/00*
U.S. Cl. 417—234 **7 Claims**

1. A blowing apparatus comprising a gasoline engine, an axial fan having the rotor thereof coupled with a rotating shaft of said engine, an annular body composed of fan, suction and discharge housings, a flexible tube connected to the front end of the discharge housing, a blowing nozzle connected to the forward end of said flexible tube, a shoulder belt attached to said annular body, said axial fan having the stator blades thereof removably secured to the inner periphery of the fan housing, said engine having a casing thereof detachably fixed to the stator blades, the suction housing surrounding said engine, a cone-guide coaxially disposed in front of the rotor and partially radially secured to the inner periphery of the discharge housing, the fan housing being removably, air-tightly

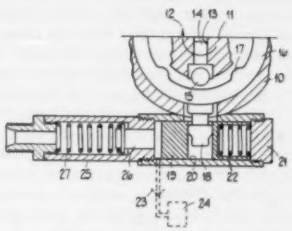


and peripherally connected to both the suction and discharge housings.

4,132,508
FUEL INJECTION PUMPING APPARATUS

Dorian F. Mowbray, Burnham, England, assignor to C.A.V. Limited, Birmingham, England

Continuation of Ser. No. 613,805, Sep. 16, 1975, abandoned. This application Feb. 28, 1977, Ser. No. 772,746
Claims priority, application United Kingdom, Oct. 1, 1974, 42508/74
Int. Cl.² F04B *29/00*; F02M *39/00*
U.S. Cl. 417—462 **3 Claims**



1. A fuel injection pumping apparatus comprising a rotary distributor member defining a bore including a reciprocal pumping plunger, a cam member for effecting reciprocation of said plunger in said bore to provide a pumping action on rotation of said distributor member, means mounting said cam member for limited rotational movement during rotation of said distributor member and means controlling said limited rotational movement of the cam member to control the injection pressure characteristics of the apparatus, said controlling means comprising a first cylinder, a first piston in said first cylinder, connection means between said cam member and said first piston, said connection means urging said first piston towards one end of said first cylinder as a result of a reaction force established between said cam member and said plunger during a pumping stroke of said plunger, a second cylinder having one end communicating with said one end of said first cylinder and having its other end open to atmosphere, said second cylinder including a second piston and resilient means in said second cylinder, said resilient means urging said second piston towards said one end of said first cylinder and resisting movement of said first piston towards said one end of said first cylinder until said reaction force increases sufficiently to overcome the force of said resilient means to effect movement of said first piston and movement of said cam member in the direction of rotation of said distributor member and said first piston and said cam member being moved in reverse direction under the influence of said second piston and said resilient means when said reaction force decreases below the force of said resilient means.

4,132,509
PERISTALTIC PUMP WITH MEANS TO VARY RELATIVE PUMPING VOLUME BETWEEN TUBES

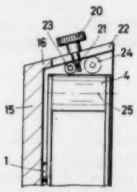
Paul Bongartz, Isny-Kleinhaslach, and Franz Haag, Isny, both of Fed. Rep. of Germany, assignors to Motan Gesellschaft mit beschränkter Haftung, Isny, Fed. Rep. of Germany

Filed Apr. 28, 1977, Ser. No. 792,056

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1976, 2619160

Int. Cl.[2] F04B *43/08, 43/12, 45/06*

U.S. Cl. 417—475 **10 Claims**



1. A device for entering dyes of from liquid to pulverous consistency into synthetic material processing machines, especially extrusion and injection molding machines, which includes a hose pump comprising a housing having an inner peripheral circular section, a rotor rotably arranged within said housing section and having an outer marginal portion, motor means drivingly connected to said rotor for rotating the same, a plurality of rollers rotatably connected to said outer marginal portion of said rotor and being distributed around said rotor in spaced relationship to each other, at least one compressible conveyor hose means of elastic material contacted by said rollers and extending between said rollers and said inner peripheral housing section at least half about said rotor so that in response to the rotation of said rotor said rollers roll on said hose means while compressing successive sections thereof, and means for varying the volume of said hose means between the respective hose means sections being compressed to thereby adjust the delivery quantity of said pump per revolution of said rotor, said compressible conveyor hose means including at least two hoses, said means for varying the volume of said hose means between the respective hose means sections being compressed includes an adjusting device for displacing at least one conveyor hose means in axial direction of said pump housing, said adjusting device extending from the outside of said pump housing into the interior thereof.

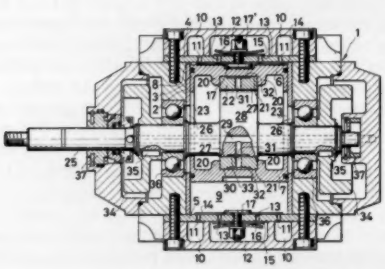
4,132,510
COMPRESSOR

Shigeo Takahashi, Kawasaki, Japan, assignor to Sampei Komiya, Gumma, Japan

Filed Jun. 6, 1977, Ser. No. 803,848

Int. Cl.[2] F04B *39/02, 21/04*

U.S. Cl. 417—534 **3 Claims**



1. A compressor of the Scotch-yoke type, comprising a compressor body, a hollow cylinder positioned in said compressor body, means closing the opposite ends of said cylinder, a piston fitted in said cylinder and being slidable therein in the axial direction of said cylinder, said piston comprising a pair of hollow cylindrical members each having a cylindrically shaped axially extending side wall, an end wall closing one end of said side wall with the other end thereof being open, the open ends of said side walls disposed in mated engagement with one another, bolts penetrating through said side walls of said cyclindrical members in the axial direction thereof for securing said cylindrical members together, each said end wall having a surface facing the other said end wall with a guide groove formed in each of the facing surfaces and extending perpendicularly of the axial direction of said piston, a pair of diametrically opposed shaft holes and a pair of diametrically opposed windows provided in the side walls of said cylindrical members with said pair of shaft holes being disposed angularly spaced by 90° from said pair of windows, said cylinder and said means closing the ends thereof in combination with said end walls of said piston defining a pair of variable working chambers each located at an opposite end of said piston, a slider positioned within said piston and having a circular cam hole therethrough with the axis of said cam hole extending perpendicular of the axis of said piston, a sliding surface provided on each of the opposite ends of said slider which extend transversely of the axis of said piston with each of said sliding surfaces disposed in sliding contact with a different one of the said guide grooves of said piston, said slider being movably displaceable in said piston in the direction perpendicular to the axial direction of said piston so that during a part of the slider movement the slider protrudes through each of said windows in said piston, a drive shaft extending into said compressor body and through said cylinder and said shaft holes in said piston with said shaft extending perpendicularly of the axis of said piston and perpendicularly of the sliding direction of the sliding surfaces on said slider, a crank cam eccentrically mounted on said shaft for rotation therewith and said crank cam positioned in said cam hole in said slider so that the driving force of said shaft can be conveyed through said crank cam to said slide, a plate-like oil sump formed in each of the sliding surfaces of said slider in the surface thereof disposed in sliding engagement with said guide grooves of said piston, a communicating hole opened through said slider between each of said oil sumps and said cam hole, an oil supply hole for supplying lubricating oil extending axially through said shaft and a lateral hole in said shaft extending outwardly from said oil supply hole through said shaft for connection to said communicating holes as said shaft rotates for supplying oil to said oil sumps.

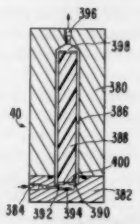
4,132,511
DAMPER FOR HIGH PRESSURE PUMPING SYSTEM

Detlef R. Boehme, Walnut Creek; Kenneth C. Judah, Napa, and Stephen J. Luchetti, Berkeley, all of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 630,102, Nov. 10, 1975, abandoned. This application Oct. 11, 1977, Ser. No. 840,710

Int. Cl.[2] F04B *11/00*

U.S. Cl. 417—540 **2 Claims**



1. In combination with a high pressure liquid pumping system including a reciprocating pump, means for damping pulsa-

tions in the liquid flow from said pump, said damping means comprising:

a hollow canister, the interior walls of said canister defining an interior region having a generally elongate dimension;

said canister having inlet means for receiving said liquid flow from said pump into said interior region and outlet means for exit of said liquid flow from said pump out of said interior region, said inlet means being spaced apart from said outlet means along said elongate dimension;

a compressible body positioned in said interior region apart from said inlet means so as to form a mixing volume in said interior region between said inlet means and said compressible body, said compressible body being configured to provide a passageway for said liquid flow from said pump through said canister to said outlet means along a path between said compressible body and the interior walls of said canister, the compression and decompression of said compressible body in response to pulsations in said liquid flow from said pump serving to dissipate the energy carried by said pulses to thereby damp said pulses; and

mixing means disposed in said mixing volume for agitating said liquid flow from said pump in said mixing volume.

4,132,512

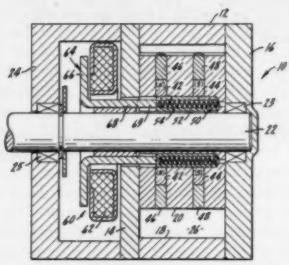
ROTARY SLIDING VANE COMPRESSOR WITH MAGNETIC VANE RETRACTOR

Richard W. Roberts, Lombard, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 7, 1977, Ser. No. 849,157

Int. Cl.[2] F04C *29/10*

U.S. Cl. 418—23 **21 Claims**



1. A rotary sliding vane compressor comprising: a rotor; a housing; means defining a fluid compression cavity in said housing having a fluid inlet and a fluid outlet; at least one vane carried by said rotor, said vane having a portion thereof which is permanently magnetized; and magnetic means cooperating with the permanently magnetized portion of said vane and selectively moveable between first and second positions, said first position creating a force urging said vane outwardly to effect compression of fluid introduced into said compression cavity, said second position creating a force urging said vane inwardly to reduce compression of the fluid in said compression cavity.

4,132,513

ROTARY ENGINE COUNTERWEIGHT SYSTEM

Mark R. Kulina, Franklin Lakes, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed Sep. 26, 1977, Ser. No. 836,578

Int. Cl.[2] F01C *1/02, 11/00, 21/00;* **F16C** *3/06*

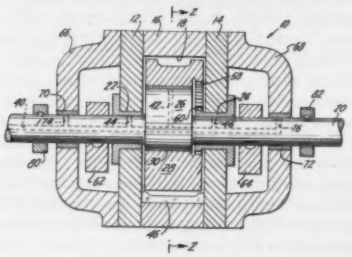
U.S. Cl. 418—60 **8 Claims**

1. A rotary mechanism comprising:

(a) a housing having axially-spaced first and second side walls and a peripheral wall disposed between said side walls to form an internal cavity having a multi-lobe peripheral surface;

(b) a shaft co-axial with said cavity and extending through said side walls, said shaft having a cylindrical eccentric portion disposed within said cavity and said side walls providing a pair of sleeve bearings for supporting said shaft;

(c) a rotor member having a co-axial bore therethrough for receiving said shaft eccentric and having a sleeve bearing for supporting the rotor member on said shaft eccentric within said cavity, said rotor member having a polygonal peripheral surface with a plurality of circumferentially-spaced apex portions having sealing cooperation with the multi-lobe peripheral surface of the housing to form a plurality of working chambers between said rotor member and housing;



(d) a pair of counterweights secured to said shaft adjacent to opposite sides of the engine housing and disposed outboard of said pair of sleeve bearings and diametrically opposite to said shaft eccentric portion;

(e) means secured to said housing and providing a second pair of sleeve bearings for said shaft outboard of said pair of counterweights; and

(f) an additional counterweight secured to said shaft outboard of one of said second pair of sleeve bearings and disposed ahead of said shaft eccentric by an angle of from 80 to 120 degrees as measured about the shaft axis in the direction of shaft rotation and the unbalanced centrifugal force of said additional counterweight being small compared to that of either of said pair of counterweights.

4,132,514

HIGH PRESSURE HYDRAULIC GEAR PUMP OR MOTOR

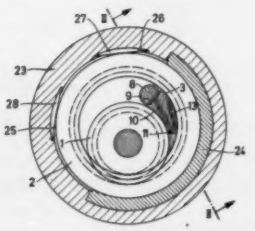
Otto Eckerle, Am Bergwald 6, 7502 Malsch, Fed. Rep. of Germany

Filed Feb. 10, 1977, Ser. No. 767,318

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1976, 2606082

Int. Cl.[2] F04C *15/00, 1/06*

U.S. Cl. 418—71 **22 Claims**



1. In a high pressure hydraulic gear pump of the type having a housing with a main bore accommodating therein a pinion surrounded by and cooperating with an internal gear ring, and a curved filler member occupying at least that end sector of the sickle-shaped space between the pinion and the internal gear ring where the gear teeth converge and in which the pressure

space of the pump is located, in such a gear pump, the combination comprising:

a radially movable sealing plate interposed between at least one of the two peripheral surfaces of the filler member and the associated gear periphery, at a short circumferential distance from the converging gear teeth, the sealing plate having a curved outer surface in alignment with said associated gear periphery and bearing against the gear teeth which move along said gear periphery;

a shallow radial recess in the filler member, for the accommodation therein, with a small circumferential clearance, of the sealing plate;

means for positioning the sealing plate in the circumferential sense in relation to the filler member, said positioning means including a circumferentially forwardly facing abutment flank on the rear side of said radial recess;

means for biasing the sealing plate radially away from the filler member, towards said moving gear teeth, said biasing means including a pressure fluid space defined between the filler member and the sealing plate and channel means bringing pressurized fluid to said pressure fluid space, when the pump is in operation, said biasing means further including spring means engaged between the filler member and the sealing plate, for the creation of a radial bias which is also present when the pump is in a pressureless state; and

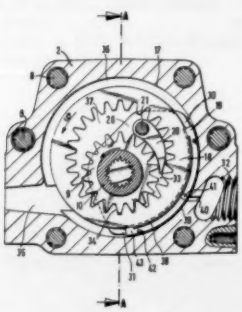
means for positioning and abutting the filler member in the circumferential sense, against its inherent operative tendency of backing away from the converging, pressure generating gear teeth, at least that portion of the filler member which cooperates with the sealing plate being likewise radially movable, so that, under the influence of said sealing plate biasing means, the sealing plate bears at all times against one gear, while the filler member bears against the other gear, thereby taking up any changes in gear position due to manufacturing tolerances, or resulting from operational wear and displacements, under changing temperatures and pressures.

4,132,515

CRESCENT GEAR PUMP OR MOTOR HAVING BEARING MEANS FOR SUPPORTING THE RING GEAR

Heinz W. Krüger, Beethoven Str. 5, 6390 Usingen, Germany

Continuation of Ser. No. 736,248, Oct. 27, 1976, abandoned.
This application Jan. 5, 1978, Ser. No. 867,353
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1975, 2547994
Int. Cl.[2] F04C *15/00, 1/06*
U.S. Cl. 418—71 **6 Claims**



1. A gear pump or motor comprising

a body having a cavity and high pressure and low pressure ports extending to said cavity,

a pinion having a shaft means journalled in the body for rotation of the pinion in said cavity,

an internally toothed ring gear in said cavity and meshing with said pinion,

said ring gear and said pinion including an interspace therebetween,

bearing means in said cavity interposed between the periphery of said ring gear and said body adjacent to said low pressure port for yieldingly supporting said ring gear,

said bearing means defining, at its outer face, a first arcuate area of low pressure and, at its inner face, a second area of low pressure,

said first area being smaller than said second area and said areas being connected to one another,

a filling member in said interspace,

said filling member having a sickle-shaped cross section and subdividing said interspace into a low pressure space which is connected to said low pressure port and a high pressure space which is connected to said high pressure port,

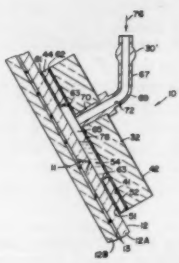
means for mounting said filling member in said interspace between said pinion and said ring gear for pivotal movement and shifting movement transversely to the pivot axis, whereby said cavity is connected to high pressure except for said low pressure space and said low pressure areas.

4,132,516

APPARATUS REPAIRING DAMAGE TO A SURFACE

William Story, 16214 N. Nebraska Ave., Lutz, Fla. 33549

Filed Jul. 21, 1977, Ser. No. 817,602
Int. Cl.[2] B32B *35/00*; B29C *11/00*
U.S. Cl. 425—13 **6 Claims**



1. An apparatus for repairing a damage to a glass surface, comprising in combination:

a flat body member having a first and a second surface;

said body member being transparent for enabling visual observation of the damage during the repairing process;

a disposable resilient intermediate member having a first and a second surface;

said intermediate member being a sheet commensurate in size with said flat body member and having a generally central cut out region;

means for glueing said first surface of said intermediate member to said glass surface and for glueing said second surface of said intermediate member to said first surface of said body member forming a cavity in said cut out region with said damage located in said cavity;

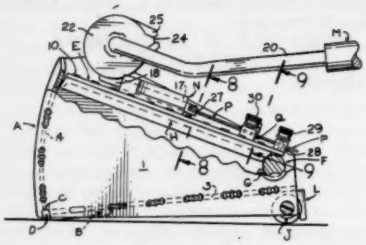
access means in said body member communicating with said cavity for inserting a glass repair material to repair the damage; and;

said access means including a conduit extending through said body member having a coupling device for enabling insertion of said repair material through and for enabling application of a varying pressure in the cavity region of said intermediate member.

4,132,517
RECESS FILLING MASTIC APPLICATOR WITH STRAIGHT TORSIONAL SPRING AND MEANS FOR ALTERING EFFECTIVE SPRING LENGTH

Robert G. Ames, 2150 Forest View, Hillsborough, Calif. 94010

Filed Nov. 21, 1977, Ser. No. 853,179
Int. Cl.[2] B29C *3/00*
U.S. Cl. 425—87 4 Claims



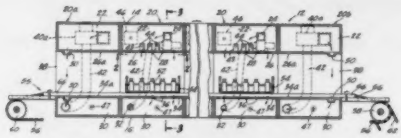
1. A recess filling mastic applicator comprising:
(a) a body for receiving mastic and having spaced apart side walls, an arcuate rear wall and a bottom wall having a mastic outlet opening disposed adjacent to the arcuate rear wall;
(b) a mastic pressing plate having its front edge pivotally connected to said side walls, the side edges of said plate being disposed adjacent to the side walls and the rear edge lying adjacent to said arcuate rear wall;
(c) trowelling blade extending transversely across the lower edge of said arcuate trailing wall and having an arcuate concave lower edge so that only the two ends of said blade will contact with the surface over which the tool body is moved;
(d) adjustable means for pivotally connecting a handle to said plate and including means for shifting the pivot point between said handle and said plate toward the front or rear end of the tool and fixing the pivot point so that when pressure is applied on the handle and plate for extruding mastic, the desired amount of pressure can be applied to said blade through the plate pressing on the mastic in the tool body and the mastic pressing on the bottom plate which in turn causes the arcuate end wall to apply the desired pressure on the blade for cutting the extruded mastic and forming a crown effect to the upper surface thereof as the tool body is moved over the surface;
(e) said adjustable means for shifting the pivotal connection between said handle and said pivoted mastic pressing plate including a bearing mounted on the upper surface of said plate and having a bore therein whose axis parallels the planes of the side walls of said tool body;
(f) the pivotal connection between said handle and said mastic pressing plate including a member connected to said handle and having a rod slidably received in the bore of said bearing; and
(g) means for moving said rod longitudinally within said bearing for shifting the member along said plate and securing said rod in adjusted position for holding the member in its adjusted position and thereby determining the position of the point of pivotal connection on said plate between the handle and said plate.

4,132,518
APPARATUS FOR MANUFACTURING PLASTIC LENSES

Irving Rips, Beverly Hills, Calif., assignor to Realite Optical Company, Los Angeles, Calif.

Filed Oct. 18, 1977, Ser. No. 843,170
Int. Cl.[2] B29D *11/00;* B29C *1/00*
U.S. Cl. 425—143 10 Claims

1. An apparatus for controllably heating an exothermic liquid mixture contained in a mold comprising:
(a) a mold for containing the exothermic mixture;
(b) an elongated enclosure having interconnected top, bottom, and side walls;
(c) vertically spaced apart transversely extending first and second internal walls interconnected to said side walls of said enclosure to define an upper plenum, a lower plenum and a longitudinally extending central passageway therebetween, said internal walls each being provided with a multiplicity of spaced apart apertures;

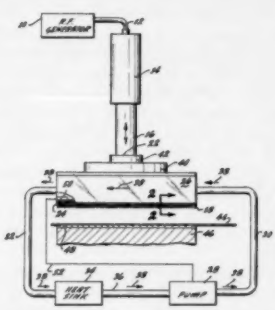


(d) air-circulating means for circulating air between said upper and lower plenums through said intermediate passageway;
(e) heating means for controllably heating the air being circulated through said intermediate passageway; and
(f) conveyor means for transporting the mold through said intermediate passageway at a controlled rate of speed.

4,132,519
CONTROLLED POROSITY OF UNCURED REINFORCED THERMO-SETTING PLASTIC MATERIAL

Clyde H. Reed, Riverside, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed Oct. 28, 1977, Ser. No. 846,457
Int. Cl.[2] B29C *17/10*
U.S. Cl. 425—174.2 2 Claims



1. An apparatus for perforating and partially curing in a selected area a sheet of uncured unperforate thermoplastic material comprising:
a base member;
a plurality of pins carried by said base member;
a platform member having a resilient surface adjacent said base member;
means for providing relative movement of said members between a first position wherein they are spaced apart and a second position wherein said material is positioned between said members, said pins penetrate said material and engage said resilient surface;
sonic means associated with said base member for vibrating said base member during penetration of said material for providing an elevated pin temperature for partially curing said material adjacent to said pin to prevent the uncured plastic material from flowing into and closing the perforations when said pins are withdrawn; and
cooling means for maintaining the temperature of said pins at a level just sufficient to partially cure said material adjacent said pins.

4,132,520

APPARATUS FOR THE PRODUCTION OF A MIDDLE LAYER OF CHIPBOARDS OR THE LIKE AND/OR FOR THE MANUFACTURE OF CHIPBOARDS CONSISTING ESSENTIALLY ONLY OF ONE MIDDLE LAYER

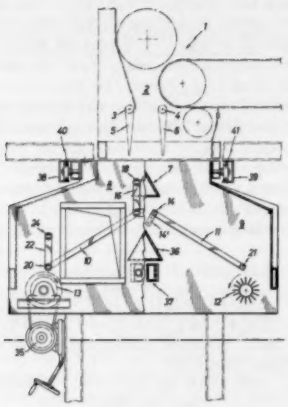
Albert DeMets, Kachtem, Germany, assignor to Bison-Werke Bähre and Greten GmbH & Co. KG, Germany

Continuation of Ser. No. 575,041, May 6, 1975, abandoned. This application Mar. 28, 1977, Ser. No. 781,924

Claims priority, application Fed. Rep. of Germany, May 9, 1974, 2422468

Int. Cl.[2] B29B *1/04;* B29J *5/00*

U.S. Cl. 425—199 23 Claims



1. Apparatus for forming a composite layer of particles for production of particle board comprising:

a movable support for receiving said particles,

an inclined screen disposed above said movable support, said inclined screen having an upper edge and a lower edge,

feeding means for feeding a mixture of various sized particles, said feeding means being disposed above said inclined screen and including means for depositing said mixture of particles on the upper surface of said screen, said screen having openings the rethrough for permitting smaller ones of said particles to fall through said screen onto said movable support while larger ones of said particles pass over said lower edge of the screen without falling through said openings,

and spreading means for spreading said larger particles onto said movable support underneath said inclined screen so that said larger particles passing over said lower edge are recombined in a predetermined manner with said smaller particles falling through said screen to form a composite particle layer such that the composite layer includes an increased proportion of larger particles near the extreme edges thereof due to the recombining of said larger particles by said spreading means.

4,132,521

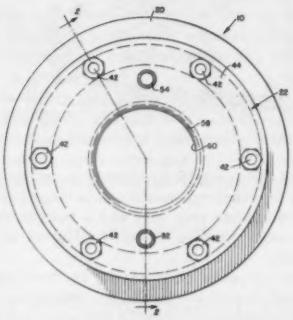
APPARATUS FOR FORMING AND POLISHING SOAP BILLETS

John F. Doremus, Central Valley, N.Y., assignor to Avon Products, Inc., Suffern, N.Y.

Filed Oct. 6, 1977, Ser. No. 839,896

Int. Cl.[2] B29C *17/00*

U.S. Cl. 425—383 8 Claims



1. An apparatus adapted for continuously and automatically forming a highly polished and lustrous surface on the exterior surface of an advancing billet of soap which emerges from the nozzle of an extrusion apparatus, comprising in combination first means operatively communicating with the extrusion nozzle such that it is in direct communication with and receives therethrough an advancing soap billet exiting from the nozzle, said first means having at least opposed inlet and outlet portion means and a closed cavity forming a reservoir therebetween, the inlet means defining an opening enabling the advancing billet to enter the cavity; reservoir means containing a lubricant fluid compatible with the soap to ensure a polished surface about the advancing soap billet, the outlet means has a continuously smooth and generally tapered wall surface that defines an outlet opening for the cavity, which opening is dimensioned and configured to be less than the cross-sectional dimension of the emerging soap, such that the tapered wall surface contacts substantially the entire peripheral surface of the soap, and the outlet opening wall surface gently wipes the solution from the advancing billet surface and continuously presses its exterior surface so as to reduce the cross-sectional dimension and form the highly polished and lustrous billet surface.

4,132,522

CONTROL OF DYE MIGRATION IN THERMOSOL DYEING PROCESSES

Andrew Fono, Montclair, N.J., and Ray F. Patton, Burlington, N.C., assignors to Royce Chemical Company, East Rutherford, N.J.

Filed Mar. 11, 1977, Ser. No. 776,854

Int. Cl.[2] D06P *3/87, 1/56;* **C09B** *67/00*

U.S. Cl. 8—17 **11 Claims**

1. A Thermosol process for dyeing a cellulosic textile with a vat-disperse dye mixture which comprises:

(a) passing a cellulosic textile through a pigment pad containing (1) an aqueous dispersion of a dye mixture of an unreduced vat dye and a disperse dye and (2) an antimigrating agent comprising an aqueous solution of about 0.25 to 0.55 ounces per gallon of a non-ionic water-soluble polymer selected from the group consisting of melamine formaldehyde and urea formaldehyde polymers and about 0.15 to 0.45 ounces per gallon of a salt selected from the group consisting of sodium chloride, sodium sulfate, sodium formate, potassium chloride, potassium sulfate, potassium formate, and potassium acetate, which is added to the aqueous dispersion of the dye mixture;

(b) drying the textile with the dye mixture thereon;

(c) heating the dried textile to fix the disperse dye in the dye mixture;

(d) passing the textile with the unreduced vat dye and fixed disperse dye thereon through a chemical pad solution maintained at a temperature above the reduction temperature of the vat dye of the dye mixture; said chemical pad solution comprising sodium dithionite, sodium hydroxide and an aldehyde bisulfite or an aldehyde sulfoxylate addition product; and

(e) subjecting the textile obtained in step (d) to steam in a developing chamber.

4,132,523

PROCESS AND AGENT FOR COLORING CELLULOSE CONTAINING BLENDED FIBER TEXTILES

Sienling Ong, Hofheim am Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Apr. 28, 1977, Ser. No. 792,044

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1976, 2619023; Aug. 7, 1976, 2635650

Int. Cl.[2] D06P *3/82;* **C09B** *67/00*

U.S. Cl. 8—21 R **18 Claims**

1. In a process for the coloration of a textile material containing cellulose and synthetic fibers in an aqueous organic medium the improvement comprising impregnating or printing said material with an aqueous composition consisting essentially of

a pigment, a disperse dyestuff or a mixture of a pigment and a disperse dyestuff

a surface-active agent,

a carrier of limited water-solubility,

an organic solvent and

a thickening agent, said composition containing per kilogram of printing paste or liter of padding liquor 30 to 200 g of surface active agent.

4,132,524

METHOD FOR WASHING RUGS AND THE LIKE

Clifford L. Hasselschwert, Rock Hill, S.C., assignor to Indoor Billboard Corporation, Charlotte, N.C.

Division of Ser. No. 742,672, Nov. 17, 1976, Pat. No. 4,095,443.

This application Dec. 22, 1977, Ser. No. 863,511

Int. Cl.[2] D06B *3/18, 3/20*

U.S. Cl. 8—151 **6 Claims**

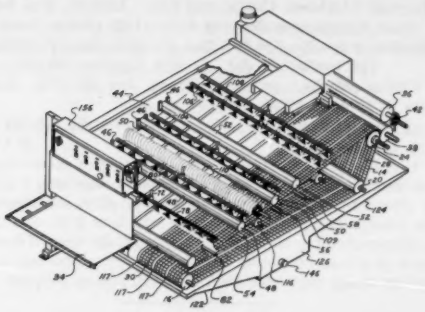
1. A method of washing rugs and the like comprising the steps of:

(a) supporting a rug with the nap thereof facing upwardly;

(b) conveying said rug upwardly along an inclined path;

(c) compressing the nap of said rug at a location extending transversely to said inclined path;

(d) directing a jet of water and detergent toward the nap of said rug as it is conveyed past said compressing location to



thereby form a pool of water and detergent immediately ascensional of said compression location which pool is continuously agitated by said directed jet to cause cleaning of said rug.

4,132,525

PROCESS FOR DYEING MATERIALS WHICH CONTAIN SYNTHETIC FIBRES USING POLYADDUCTS OF PROPYLENE OXIDE AND POLYHYDRIC ALCOHOLS

Alfred Berger, Reinach, and Hans-Ulrich Berendt, Allschwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 577,129, May 13, 1975, abandoned.

This application Apr. 8, 1977, Ser. No. 785,897

Int. Cl.[2] D06P *5/08, 1/653;* **C09B** *67/00;* **D06P** *3/82*

U.S. Cl. 8—173 **14 Claims**

1. A process for dyeing synthetic textile fibers with a dye that is sparingly soluble to insoluble in water, comprising the step of applying to the textile fibers an aqueous liquor containing the dye and a water-soluble acid ester of a polypropyleneoxide adduct of an average molecular weight of 1000 to 6000, wherein the polypropyleneoxide adduct is an adduct from reactants selected from the group consisting of propyleneoxide and a polyhydric aliphatic alcohol selected from the group consisting of ethyleneglycol, 1,3-propylene glycol, 1,2-propylene glycol, 1,5-pentane diol, glycerol and trimethylol propane, and wherein the acid ester of the poly-propyleneoxide addut is a free acid or an alkali metal salt or ammonium salt of an acid ester of the polypropyleneoxide adduct and sulfuric acid, or sulfaminic acid.

4,132,526

PROCESS FOR PROTECTING ASBESTOS-CEMENT BEARING SURFACES IN RECIRCULATING COOLING WATER SYSTEMS

Richard C. Schwarz, Croyden, Pa., and Bobby G. Chestang, Baton Rouge, La., assignors to Betz Laboratories, Inc., Tevose, Pa.

Filed Nov. 12, 1976, Ser. No. 741,447

Int. Cl.[2] C23F *11/10*

U.S. Cl. 422—1 **12 Claims**

1. A method of inhibiting the destructive effect of cooling water on asbestos-cement components of a cooling water system which comprises concurrently adjusting and/or maintaining the cooling water in said system at a pH of 6 to 10 so as to provide a positive Langelier saturation and adding to the water a sufficient amount for the purpose of a material selected from the group consisting of water soluble phosphonic acid compounds, water soluble phosphate compounds, water soluble acrylic polymers, water soluble silicates, and mixtures thereof.

4,132,527

DIAGNOSTIC COMPOSITIONS, DIAGNOSING INSTRUMENTS, AND METHODS OF MANUFACTURING SAME

Hideyuki Maekawa, Osaka, and Kaoru Ishitobi, Yao, both of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Division of Ser. No. 536,867, Dec. 27, 1974, Pat. No. 3,971,702. This application Jul. 26, 1976, Ser. No. 708,631

Claims priority, application Japan, Jan. 9, 1974, 49-5805; Mar. 3, 1974, 49-27298

Int. Cl.[2] **C07C** *87/28, 87/64;* **G01N** *31/22, 33/16*

U.S. Cl. 23—230 B **29 Claims**

1. A diagnosing instrument for detecting or measuring occult bleeding in urine or solid excrement comprising a mixture of diamino-biphenyl derivatives having alkyl substituents in the phenyl groups thereof and in which at least one of the hydrogen atoms in either of the amino groups thereof is substituted by at least one lower alkyl group having from one to four carbon atoms, supported on a bibulous, porous support.

4,132,528

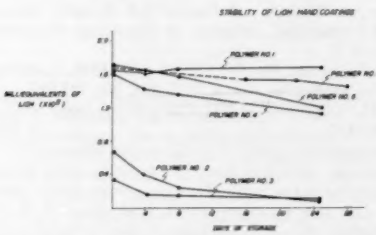
ANALYTICAL ELEMENT FOR THE ANALYSIS OF LIQUIDS UNDER HIGH PH CONDITIONS

Jon N. Eikenberry; Karl J. Sanford, and Richard C. Sutton, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 3, 1978, Ser. No. 866,731

Int. Cl.[2] **G01N** *31/22, 33/16*

U.S. Cl. 23—230 B **46 Claims**



45. A method for analysis of protein in an aqueous liquid sample which comprises

(a) treating said sample with a biuret reagent to produce a radiometrically detectable color change upon interaction of said protein with said biuret reagent, said biuret reagent composed of a composition substantially free from sodium ion and comprising, in admixture, a water soluble cupric salt, a copper chelating agent precursor, and an amount of base sufficient to provide a pH during said treatment with said sample in excess of about 12.0; and

(b) detecting said color change.

4,132,529

TEMPERATURE CONTROL IN EXOTHERMIC/ENDOTHERMIC REACTION SYSTEMS

Michael F. Schwimmer, Tucson, Ariz., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 794,152, May 5, 1977. This application Oct. 13, 1977, Ser. No. 841,876

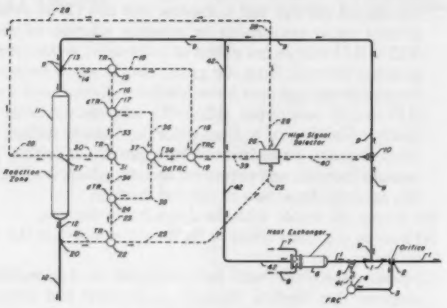
Int. Cl.[2] **B01J** *8/02;* **C10G** *35/04;* **G05D** *11/02;* **G06F** *15/46*

U.S. Cl. 23—230 A **7 Claims**

1. In a hydrocarbon conversion method wherein (1) a hydrocarbonaceous charge stock is introduced into heating means in which the temperature thereof is increased prior to passing into a reaction zone and, (2) the reactions effected in said reaction are both exothermic and endothermic in nature, the method of controlling the temperature rise through said reaction zone which comprises the steps of:

(a) sensing (i) the temperature of said charge stock at the inlet to said reaction zone and developing a first signal representative thereof, (ii) the temperature at an intermediate locus within said reaction zone and developing a second signal representative thereof, and, (iii) the temperature of the effluent from said reaction zone and developing a third signal representative thereof;

(b) comparing said inlet charge stock temperature with that temperature specified by the adjustable set point of a temperature controller, developing a fourth signal representative of said comparison and regulating the quantity of said charge stock which is caused to bypass said heating means in response to said fourth signal;



(c) measuring the difference between said first and second signals and developing a fifth signal representative of said difference;

(d) measuring the difference between said second and third signals and developing a sixth signal representative of said difference;

(e) comparing said fifth and sixth signals, developing a seventh signal representative of said comparison and readjusting the set point of said temperature controller in response to said seventh signal; and,

(f) further regulating the quantity of said charge stock which is caused to bypass said heating means in response to the readjustment of said set point.

4,132,530

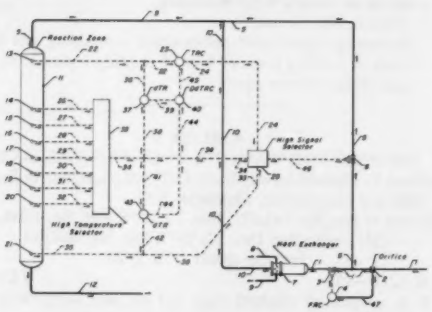
TEMPERATURE CONTROL IN EXOTHERMIC/ENDOTHERMIC REACTION SYSTEMS

Michael F. Schwimmer, Tucson, Ariz., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 841,876, Oct. 13, 1977, which is a continuation-in-part of Ser. No. 794,152, May 5, 1977. This application Nov. 16, 1977, Ser. No. 852,017

Int. Cl.[2] **B01J** *8/02;* **C10G** *35/04;* **G05D** *11/02;* **G06F** *15/46*

U.S. Cl. 23—230 A **7 Claims**



1. In a hydrocarbon conversion method wherein (1) a hydrocarbonaceous charge stock is introduced into heating means in

which the temperature thereof is increased prior to passing into an elongated reaction zone and, (2) the reactions effected in said elongated reaction zone are both exothermic and endothermic in nature, the method of controlling the temperature rise through said reaction zone which comprises the steps of:

(a) sensing (i) the temperature of said charge stock at the inlet to said reaction zone and developing a first signal representative thereof; (ii) the temperatures at a plurality of intermediate loci within said reaction zone, developing a plurality of signals, each being representative of and having associated therewith one of said temperatures, and selecting the signal representing the highest of said plurality of temperatures as a second signal; and (iii) the temperature of the effluent from said reaction zone and developing a third signal representative thereof;

(b) comparing said inlet charge stock temperature with that temperature specified by the adjustable set point of a temperature controller, developing a fourth signal representative of said comparison and regulating the quantity of said charge stock which is caused to bypass said heating means in response to said fourth signal;

(c) measuring the difference between said first and second signals and developing a fifth signal representative of said difference;

(d) measuring the difference between said second and third signals and developing a sixth signal representative of said difference;

(e) comparing said fifth and sixth signals, developing a seventh signal representative of said comparison and adjusting the set point of said temperature controller in response to said seventh signal; and,

(f) further regulating the quantity of said charge stock which is caused to bypass said heating means in response to the adjustment of said set point.

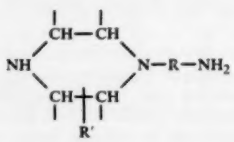
4,132,531

DETERGENT ADDITIVE AND MOTOR FUEL COMPOSITION

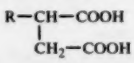
William M. Cummings, Fishkill, and Justin C. Powell, Wappingers Falls, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 16, 1977, Ser. No. 861,463
Int. Cl.[2] C10L *1/22*
U.S. Cl. 44—63 **8 Claims**

1. An additive composition comprising an amine reaction product obtained by reacting a substituted piperazine represented by the formula:



in which R is a hydrocarbyl radical having from 2 to 4 carbon atoms and R′ is hydrogen or an alkyl radical having from 1 to 3 carbon atoms with an acid lactone reaction product at a temperature in the range from above 100° to 170° C employing about one mole of said piperazine per mole of said acid lactone reaction product, said acid lactone reaction product being obtained by reacting an alkenyl succinic acid, represented by the formula:



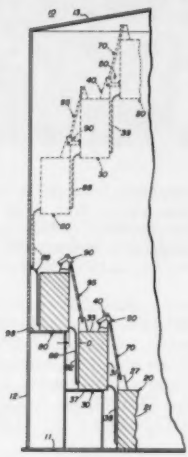
in which R is an alkenyl radical having an average molecular weight ranging from about 300 to 3000, under substantially anhydrous esterification conditions at a temperature ranging from about 50 to 100° C in the presence of a protonating agent.

4,132,532

MULTI-LIFT DRY SEAL GASHOLDER

Milton W. Heisterberg, Flossmoor, Ill., assignor to GATX Tank Erection Corporation, Chicago, Ill.

Filed Sep. 19, 1977, Ser. No. 834,462
Int. Cl.[2] F17B *1/00*
U.S. Cl. 48—174 **19 Claims**



1. An expansible fluid storage apparatus, comprising a container having a vertically extending side wall, a vertically movable piston disposed within said side wall and spaced a predetermined distance therefrom, a vertically movable generally annular fender structure disposed between said side wall and said piston and spaced therefrom, first flexible sealing means interconnecting said piston and said fender structure and closing the space therebetween, second flexible sealing means interconnecting said fender structure and said side wall and closing the space therebetween, and linkage mechanism permanently interconnecting said piston and said fender structure for accommodating vertical movement thereof with respect to each other and substantially preventing circumferential movement thereof with respect to each other, said linkage mechanism having a length such that said piston and said fender structure are at all times in vertically overlapping relationship with one another so that neither said piston nor said fender structure can move directly beneath the other, whereby said piston and said fender structure and said sealing means cooperate with said sidewall to define an expansible storage chamber with said linkage mechanism serving to maintain said piston and said fender structure in proper alignment.

4,132,533

PROCESS FOR THE PRODUCTION OF SPHERICAL BONDED ABRASIVE FROM ABRASIVE GRAIN

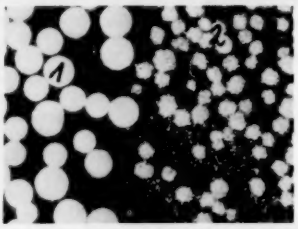
Wilfried Löhmer, Solingen, and Josef Schotten, Dusseldorf-Benrath, both of Germany, assignors to The Carborundum Company, Niagara Falls, N.Y.

Continuation of Ser. No. 673,835, Apr. 5, 1976, abandoned. This application Nov. 18, 1977, Ser. No. 852,651
Claims priority, application Fed. Rep. of Germany, Apr. 12, 1975, 2516008
Int. Cl.[2] B24D *3/32*
U.S. Cl. 51—295 **2 Claims**

1. A process for the production of abrasives in the form of hollow spheres, wherein abrasive grains are anchored on a

thermoplastic spherical supporting surface by heating, wherein the improvement comprises

(1) surrounding polystyrene foam carrier spheres having cellular structure and outer diameters prior to fusion of from 0.5 to 6 mm, with abrasive grains of from 63 to 150 microns in size; and



(2) heating the polystyrene foam carrier within the temperature range of from about 150 to about 200° C. for a time sufficient for the spheres of polystyrene foam to experience a volume reduction of more than 50%.

4,132,534

ABRASIVE PARTICLES CONSISTING OF CRYSTALLINE TITANIUM DIBORIDE IN A METAL CARBIDE MATRIX

Herbert Valdsaar, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 27, 1977, Ser. No. 837,276
Int. Cl.[2] C04B *35/56, 35/58*
U.S. Cl. 51—307 **18 Claims**

1. Abrasive particles consisting essentially of a carbide matrix and boride crystals in a composite system in which, on the basis of the total carbides and boride crystals present,

A. from 65 to 98 mole percent of the composite is a matrix of at least one solid solution in which

(i) from 10 to 81 mole percent of the total carbides is titanium carbide,

(ii) from 18 to 54 mole percent of the total carbides is zirconium carbide, and

(iii) from 1 to 36 mole percent of the total carbides is tantalum carbide; and

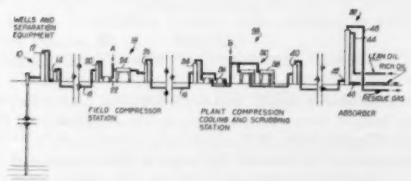
B. from 2 to 35 mole percent of the composite is crystalline titanium diboride.

4,132,535

PROCESS FOR INJECTING LIQUID IN MOVING NATURAL GAS STREAMS

Jacob B. Rivers, Jr., Oklahoma City, Okla., and Harry T. Budke, Jr., Overland Park, Kans., assignors to Western Chemical Company, North Kansas City, Mo.

Filed Nov. 17, 1976, Ser. No. 742,443
Int. Cl.[2] B01D *51/00*
U.S. Cl. 55—23 **8 Claims**



1. A method for treating natural gas streams comprising the steps of:

providing a moving gas stream traveling through a confining conduit, said gas stream principally comprising natural gas and having entrained products therein which include fine water particles and surfactant capable of forming emulsions with hydrocarbons in said stream; and

injecting a liquid into said gas stream in atomized form, said liquid containing a copolymer of alkene-substituted quaternized pyridinium groups and alkene-substituted benzene groups for substantially preventing the formation of emulsions in downstream gas processing equipment, said agent being injected into said gas stream at a level of from about 0.002 to 0.2 lbs. of copolymer per million cubic feet of said gas passing said injection point.

4,132,536

GAS FILTRATION PROCESS

John W. Andersen, Racine, Wis., assignor to Rexnord Inc., Racine, Wis.

Filed Sep. 7, 1976, Ser. No. 721,063
Int. Cl.[2] B01D *51/10*
U.S. Cl. 55—97 **6 Claims**

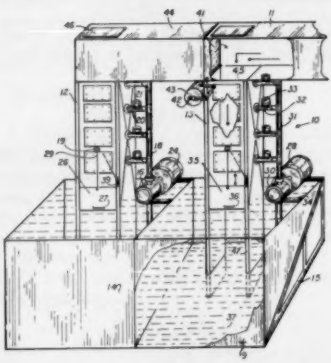
1. In a process for calcining and grinding a friable substance where an off-gas stream carrying entrained particulate material including material subject to cross-crystallization is emitted from the grinding process, and the off-gas stream is introduced to a filter media separator means for physical separation of a portion of the particulate material, introducing from 0.01% to 1.0% of a volatile organic liquid into the gas stream prior to introduction of the gas stream into the filter media separator means where the weight of the volatile organic liquid added is based on the weight of particulate material entrained in the gas stream.

4,132,537

DOWN DRAFT SCRUBBER APPARATUS

Dillard A. Bennett, 108 Brown Dr., Sanford, Fla. 32771

Filed Feb. 27, 1978, Ser. No. 881,767
Int. Cl.[2] B01D *47/02, 47/06*
U.S. Cl. 55—226 **9 Claims**



1. A down draft gas scrubber apparatus comprising in combination:

a pair of supply and collector tanks mounted adjacent each other;

a plurality of vertically extending gas scrubbing towers, each tower being operatively connected to one supply and collector tank;

a plurality of downwardly facing sprinkler nozzles mounted in each said tower;

pump means coupled between said supply and collector tanks and said plurality of sprinkler nozzles for supplying a liquid to said nozzles;

a gas input line connected to said pair of towers to supply gas thereto;

gas outlet means located in each said tower for allowing gas to escape therefrom after passing through said tower; said

gas outlet means including an adjustable sliding door mounted on a lower portion of each tower adjacent each supply and collector tank for adjusting the flow of gas therefrom;

valve means connected to said input line between said towers for connecting said input to one tower at a time, said valve means being connected to said input line between said towers and being an electrically driven valve operating a door covering the entrance to one tower in one position, and covering said input line between said towers in a second position, whereby alternate towers clean gas passing therethrough and impinging upon a liquid in said supply and collector tank.

4,132,538

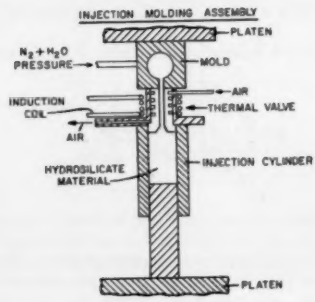
INJECTION MOLDING HYDROSILICATES

Robert W. Eolin, Corning; Gordon F. Foster, Campbell; Joseph F. Mach, and Richard O. Maschmeyer, both of Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Aug. 29, 1977, Ser. No. 828,300

Int. Cl.[2] **C03C** *15/00;* **C03B** *7/00;* **B28B** *1/24*

U.S. Cl. 65—32 **10 Claims**



7. A method for producing an injection molded article composed of a hydrosilicate glass consisting in the steps of:

(a) feeding fine-dimensioned bodies of hydrosilicate glass containing between about 1–50% by weight H_2O and consisting essentially, on the anhydrous basis in mole percent on the oxide basis, of about 10–60% Na_2O and/or K_2O and 40–90% SiO_2, the sum of those components constituting at least 75 mole percent of the total composition, into a mixer which provides a closed system capable of being pressurized to prevent water loss and is capable of mixing at viscosities of about 10^2–10^9 poises;

(b) mixing said glass in said mixer to achieve good homogeneity at a temperature wherein said glass exhibits a viscosity between about 10^2–10^9 poises, said mixer being pressurized with an inert gas and/or steam at or above the equilibrium vapor pressure of the composition being mixed;

(c) injecting said glass while at a viscosity of about 10^2–10^9 poises from an injection chamber, which is sealed and pressurized with an inert gas and/or steam at or above the equilibrium vapor pressure of the composition being injected, into a heated mold cavity to produce an article of a desired geometry;

(d) sealing and pressurizing said mold with an inert gas and/or steam at or above the equilibrium vapor pressure of the composition being molded while said glass is at a temperature such as to have a viscosity of about 10^2–10^6 poises;

(e) cooling said mold cavity to solidify a glass article therein; and then

(f) removing said glass article from said mold.

4,132,539

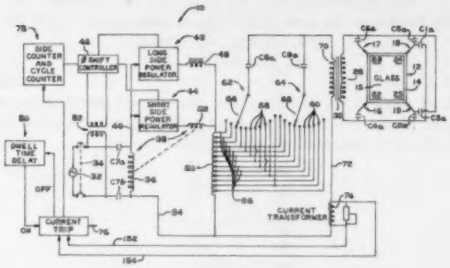
METHOD OF WELDING EDGES OF GLASS SHEETS

William G. Jeffries, Lincoln, Ill., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 23, 1977, Ser. No. 836,185

Int. Cl.[2] **C03C** *27/00;* **C03B** *23/02*

U.S. Cl. 65—40 **4 Claims**



1. A method of heating marginal edge portions of a glass sheet to a fusing temperature, said marginal edge portions having corners and a conductive material thereon, comprising the steps of:

sequentially applying a voltage to an adjacent pair of corners to pass an electrical potential along the conductive material to heat the marginal edges to a temperature sufficient for the marginal edges of the sheet to pass; and

alternately applying an electrical potential to one set of diagonally opposed corners of the sheet, and then to another set of diagonally opposed corners of the sheet.

4,132,540

PROCESS FOR REMOVING SOLVENT FROM THE RAFFINATE OF EXTRACTED PHOSPHORIC ACID AND FOR PREPARING PHOSPHATE SALTS

Robert H. Edwards, Whitehaven, and Thomas A. Williams, Backermet, both of England, assignors to Albright & Wilson Limited, Oldbury, England

Filed Jul. 18, 1977, Ser. No. 816,891

Claims priority, application United Kingdom, Jul. 27, 1976, 31257/76

Int. Cl.[2] **C05B** *7/00, 11/04*

U.S. Cl. 71—34 **20 Claims**

1. A process for preparing a phosphate salt, which comprises

contacting crude wet process phosphoric acid with a water immiscible phosphoric acid extraction solvent in at least one stage to produce (i) an aqueous phosphoric acid layer containing said water immiscible solvent in an amount not more than 7% by weight and metallic impurities, and (ii) an organic layer, which is a solution of phosphoric acid in said solvent,

separating the layers,

treating said aqueous layer with a material which is ammonia or an ammonium, alkali metal or alkaline earth metal base or salt to give a liquid organic solvent phase and an aqueous solution phase comprising phosphoric acid and ammonium or alkali or alkaline earth metal cations in an atomic ratio of M:P of between 0.1:1 and 0.6:1, wherein M is ammonium, alkali metal or twice the alkaline earth metal cations, at a temperature of less than the boiling point of said water immiscible solvent, and

separating said aqueous solution phase from said organic solvent phase.

11. A process according to claim 1 wherein said aqueous phase which is separated from said organic solvent phase is subsequently treated with ammonia or an alkali metal or alkaline earth metal compound to form a fertilizer body of the desired M:P ratio, wherein M is nitrogen and/or alkali metal and/or twice the alkaline earth metal atoms.

4,132,541

PLANT GROWTH MODIFIER AND A PROCESS FOR PREPARATION THEREOF

Tohru Hashimoto, Musashino; Akira Kawarada, and Sachiko Tamura, both of Tokyo, all of Japan, assignors to Rikagaku Kenkyusho, Saitama, Japan

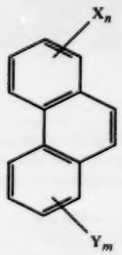
Division of Ser. No. 331,498, Feb. 12, 1973, Pat. No. 3,917,477. This application Aug. 13, 1975, Ser. No. 604,182

The portion of the term of this patent subsequent to Jul. 27, 1993, has been disclaimed.

Int. Cl.[2] A01N *5/00*

U.S. Cl. 71—76 **9 Claims**

1. A method for inhibiting the growth and germination of higher plants which comprises applying thereto an effective amount of a compound of the formula



wherein X is selected from the group consisting of hydroxy and methoxy, Y is selected from the group consisting of chloro, hydroxy, methoxy and acetyl, m is an integer having a value of from 1 to 3 and n is an integer having a value of from 0 to 3.

4,132,542

ORGANIC(THIO) PHOSPHORIC ACID ESTER COMPOUNDS AND HERBICIDAL COMPOSITIONS

Masahiro Aya; Junichi Saito; Toyohiko Kume, and Kazuomi Yasui, all of Tokyo, Japan, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

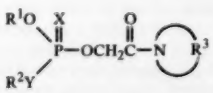
Filed Sep. 22, 1976, Ser. No. 725,615

Claims priority, application Japan, Oct. 22, 1975, 50/126322

Int. Cl.[2] A01N *9/36*; C07F *9/65*

U.S. Cl. 71—86 **34 Claims**

1. Organic (thio)phosphoric acid ester compounds of the formula



(I)

wherein

R^1 is alkyl of from 1 to 6 carbon atoms, cyclohexyl or phenyl,

R^2 is alkyl of from 1 to 6 carbon atoms,

NR^3 is 2-methyl-piperidino or hexamethyleneimino,

X is oxygen, and

Y is oxygen or sulfur

17. Method of combatting undesired vegetation in a paddy field which comprises applying to such vegetation or its habitat in a paddy field effective amounts of an organic (thio) phosphoric acid ester compound as claimed in claim 1.

4,132,543

PROMOTING SELECTIVE GROWTH OF RICE IN PADDIES

Masahiro Aya; Nobuo Fukazawa; Kazuo Kurihara, and Itsuro Kobori, all of Tokyo, Japan, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jul. 31, 1974, Ser. No. 493,431

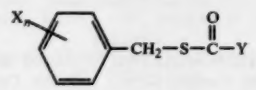
Claims priority, application Japan, Aug. 8, 1973, 48-88521

Int. Cl.[2] A01N *9/00*

U.S. Cl. 71—88 **16 Claims**

1. A composition promoting the growth of rice consisting essentially of, by weight,

(a) about 4 to 30 parts of a thiolcarbamate of the formula



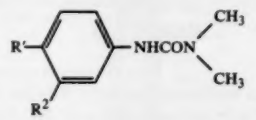
wherein

X is halogen or a lower alkoxy or lower alkyl radical,

Y is a dialkylamino with up to 4 carbon atoms per alkyl radical, hexamethylenimino or 2-methylpiperidino radical, and

n is 1 or 2, (if n is 2 the X radicals may be identical or different)

(b) about 2 to 8 parts of a phenylurea of the formula



wherein

one of R′ and R^2 is difluorochloromethylmercapto and the other is difluorochloromethylmercapto, chloro or hydrogen, and

(c) about 10 to 35 parts of O,O-diethyl-S-(2-ethylmercaptoethyl)-thionothiolphosphate.

4,132,544

N-(1,1-SUBSTITUTED PROPYNYL)-α(3,5-SUBSTITUTED PHENOXY) ALKYL AMIDES AND THEIR USE AS HERBICIDES

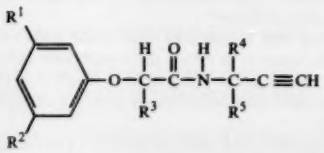
Duane R. Arneklev, Sunnyvale; Don R. Baker, Orinda, and Francis H. Walker, Mill Valley, all of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 617,454, Sep. 29, 1975, Pat. No. 4,051,184, which is a continuation of Ser. No. 464,715, Apr. 26, 1974, abandoned, which is a continuation of Ser. No. 353,871, Apr. 23, 1973, abandoned, which is a continuation of Ser. No. 157,058, Jun. 25, 1971, abandoned. This application Apr. 29, 1977, Ser. No. 792,162

Int. Cl.[2] A01N *9/20*

U.S. Cl. 71—118 **8 Claims**

1. The method of controlling undesirable vegetation which comprises applying to the area where control of said vegetative growth is desied, a growth controlling amount of a compound having the formula



in which R^1 and R^2 are both chlorine or both methyl; R^3 is

ethyl, R^4 is hydrogen or methyl and R^5 is hydrogen, methyl or ethyl.

4,132,545

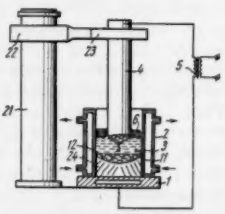
METHOD OF ELECTROSLAG REMELTING PROCESSES USING A PREHEATED ELECTRODE SHIELD

Volf I. Rabinovich, ulitsa Gagarina, 74, kv. 27; Jury N. Kriger, ulitsa Oktyabraskaya, 38, kv. 59, both of Chekhov, Moskovskoi oblasti; Igor A. Svitenko, korpus 61, kv. 149, Moscow, Teply Stan, 5 mikroraion, and Viktor E. Sapunov, ulitsa Gagarina, 60, kv. 10, Chekhov Moskovskoi oblasti, all of U.S.S.R.

Continuation of Ser. No. 638,942, Dec. 8, 1975, abandoned. This application Nov. 23, 1977, Ser. No. 854,208

Int. Cl.[2] C22B *4/00*; H05B *7/18*

U.S. Cl. 75—10 C 5 Claims



1. An improved method of effecting an electroslag remelting process, comprising the steps of dipping at least one electrode into a slag bath; passing electric current through said electrode and said slag bath, said current heating the slag to at least the melting point of the metal of said electrode; shielding said electrode upon establishing the molten slag bath and a metal pool by lowering thereafter directly on essentially the entire surface area of said slag bath a sufficiently large, preheated disc with at least one opening for the passage of said electrode; said disc being of an electrically conducting carbonaceous material which has superior electrical conductivity than that of said molten slag and whose specific density is lower than that of said bath so that the disc will float in the slag without coming in contact with said metal pool; and as said disc is consumed, shielding said electrode as required with additional discs, whereby heat losses to the atmosphere and power consumption are reduced by said method.

4,132,546

SMELTING OF IRON ORE WITH PARTIALLY DRIED LIGNITE

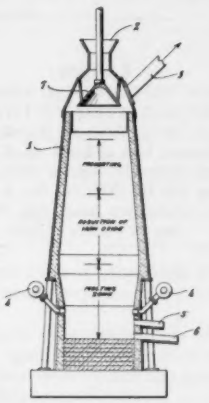
Edward S. Roberts, 214-05 33rd Ave., Bayside, Queens, N.Y. 11316

Filed Nov. 30, 1977, Ser. No. 855,974

Int. Cl.[2] C21B *5/00*

U.S. Cl. 75—42 5 Claims

1. A method of producing pig iron by the blast furnace procedure which comprises introducing iron ore, slagging material, and partially dried lignite or sub-bituminous coal by subjecting the lignite or coal to the action of liquid hot water near the boiling point of water and under sufficient pressure so that the water does not vaporize into steam, whereby the lignite or coal is shrunken to the degree that its strength is



adequate for blast furnace operation, and introducing a blast of oxygen containing gas in the bottom of the blast furnace.

4,132,547

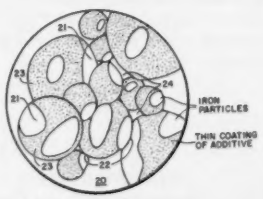
METHOD OF PRODUCING SELF-SUPPORTING FULLY ACTIVATED IRON ELECTRODES BY THERMAL REDUCTION-SINTERING

Edward S. Buzzelli, Franklin Borough, and George R. Folser, Lower Burrell, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 27, 1977, Ser. No. 801,121

Int. Cl.[2] B22F *5/00, 3/00*

U.S. Cl. 75—211 10 Claims



1. A method of making a self-supporting, fully activated electrode structure consisting of iron active material particles comprising the steps of:

(A) mixing 100 parts of metallic iron particles, consisting of essentially pure Fe, with between about 0.5 part to about 5.0 parts of a water soluble metal sulfate additive, effective to activate the iron, selected from the group consisting of $MgSO_4$, $CdSO_4$, $MnSO_4$, $ZnSO_4$, $BaSO_4$, $Cr_2(SO_4)_3$, $CuSO_4$, $CaSO_4$, Li_2SO_4, their hydrates and mixtures thereof, and an amount of water effective to form a thin coating of the metal sulfate on the surface of the metallic iron particles; and then

(B) drying the mixture and sizing the mixture to provide particles having an average particle size of between about 10 microns to about 275 microns diameter; and then

(C) pressing the coated metallic iron particles to provide a plaque; and then

(D) reducing and sintering the plaque consisting of the coated metallic iron particles at between about 700° C to about 1,000° C, in a reducing atmosphere, to provide an interconnected, self-supporting metallic electrode structure consisting solely of fully charged metallic iron particles, consisting of essentially pure Fe, coated with the

activator metal of the additive, said electrode being capable of immediate discharge.

4,132,548

PROCESS FOR REPRODUCING IMAGES OF FINE LINES OR CHARACTERS OF LOW DENSITY

Koji Nagai, Itami; Haruki Iwatsuki, Toyokawa; Sanji Inagaki, and Hiromi Kameda, both of Itami, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 15, 1977, Ser. No. 816,165
Claims priority, application Japan, Aug. 20, 1976, 51/100001
Int. Cl.² G03G *13/044*
U.S. Cl. 96—1 TE **11 Claims**

1. A process for reproducing an electrostatic latent image of an original formed on a photosensitive member, comprising the steps of:

transferring the electrostatic latent image onto a transfer paper by an electrostatic latent image transfer apparatus and developing said transfer paper with a wet type developing apparatus to obtain a reproduced image;

the step of transferring including the step of transferring charges onto substantially the entire area of the non-image surface portions of the transfer paper corresponding to the non-image portions of the original to assure transfer of images of fine lines and characters of low densities; and

said step of developing including passing said transfer paper through at least one electrode effective region and at least one electrode non-effective region with the electrode effective region having a potential greater than the potential of the non-image portion of the transfer paper and a polarity the same as the latent image applied to said portion to prevent development of the images of fine lines and characters and said non-image portions in said at least one electrode effective region and to develop said images of fine lines and characters in said at least one electrode non-effective region, said transfer paper passing through said electrode non-effective region within a time less than two seconds.

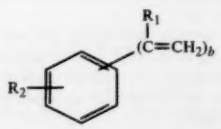
4,132,549

IMAGING SYSTEM

Frank J. Loprest, Binghamton, N.Y., and Eugene F. McInerney, Chagrin Falls, Ohio, assignors to GAF Corporation, New York, N.Y.

Filed Nov. 19, 1976, Ser. No. 743,476
Int. Cl.² G03C *1/72*
U.S. Cl. 96—35 **10 Claims**

1. A photo-induced thermally degradable imaging system comprising a photographically acceptable support suitable for positioning in an imaging mode which is provided with a continuous, water-insoluble film of a peroxide copolymer of oxygen and a vinyl aromatic monomer having the structural formula:



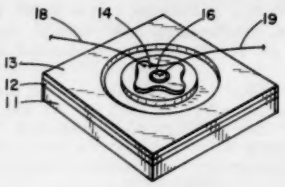
wherein R_1 can be hydrogen or an alkyl group containing from 1 to 4 carbon atoms, R_2 is hydrogen, an alkyl group containing from 1 to 4 carbons atoms, an aryl group containing from 6 to 12 carbon atoms or a halogen atom and b is an integer from 1 to 2.

4,132,550

PHOTORESISTS WITH PARTICLES LESS THAN ONE MICRON

Ronald R. Bowman, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 456,494, Mar. 1, 1974, abandoned, which is a continuation of Ser. No. 254,479, May 18, 1972, abandoned, which is a division of Ser. No. 55,579, Jul. 16, 1970, Pat. No. 3,709,695, which is a continuation of Ser. No. 528,540, Feb. 18, 1966, abandoned. This application Nov. 24, 1976, Ser. No. 744,831
Int. Cl.² G03C *5/00, 1/68*
U.S. Cl. 96—36 **3 Claims**



1. A method for forming photoresist patterns on a semiconductor substrate during its processing to form semiconductor devices, comprising:

providing a photoresist comprising polyisoprene, natural rubber or formaldehyde novolak resin in which substantially all particles of said resin are of a size less than one micron in all dimensions,

coating said semiconductor substrate with a thin film of said photoresist,

forming a pattern in said thin film of photoresist,

and carrying out a process operation in the fabrication of semiconductor devices on portions of said substrate free of said thin film of photoresist.

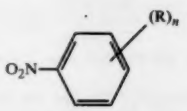
4,132,551

HIGH TEMPERATURE PROCESSING OF PHOTOGRAPHIC SILVER HALIDE MATERIAL

Robert J. Pollet, Vremde; Robrecht J. Thiers, Brasschaat; Theofiel H. Ghys, Kontich; Antoon L. Vandenberghe, Hove; Herman A. Philippaerts, Edegem, and Hubert Vandenabeele, Mortsel, all of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Continuation of Ser. No. 289,094, Sep. 14, 1972, abandoned. This application Jan. 15, 1975, Ser. No. 541,123
Int. Cl.² G03C *5/30*
U.S. Cl. 96—66.5 **6 Claims**

1. Method of producing photographic images which comprises developing an exposed photographic element comprising a support and at least one photographic silver halide emulsion, at a temperature above 30° C., wherein the said development is carried out in the presence of at least one non-quaternary, non-heterocyclic nitrobenzene compound corresponding to the formula:



wherein:

$(R)_n$ stands for one or more substituents selected from hydrogen, a halogen atom, an alkyl group, an alkenyl group, an alkynyl group, an alkoxy group, an alkylmercapto group, an amino group, an aryl group, hydroxy, nitro, cyano, sulpho or carboxy in acid or salt form, alkoxycar-

bonyl and an acyl group derived from a carboxylic or sulphonic acid.

4,132,552

DIMENSIONALLY STABLE POLYESTER FILM SUPPORTS WITH SUBBING LAYER THEREON

August J. Van Paesschen, Antwerp; Lucien J. Van Gossum, Kontich, and Jan J. Priem, Mortsel, all of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Nov. 3, 1976, Ser. No. 738,487

Claims priority, application United Kingdom, Nov. 7, 1975, 46200/75

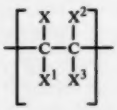
Int. Cl.² G03C *1/78, 1/96*

U.S. Cl. 96—87 R **21 Claims**

1. A process for the manufacture of a dimensionally stable polyester film support carrying a primer coating to be eventually covered in part by a subsequently applied coating and in part exposed uncovered, said primer coating being adapted to improve the adhesion thereto of said subsequently applied coating, while exhibiting desirable mechanical properties in the exposed areas thereof, which process comprises applying to an at most monoaxially stretched polyester film support a primer layer of a coating composition from an aqueous dispersion, drying said layer, stretching the coated support biaxially or in a direction perpendicular to the said first stretching operation together with the polyester film support and heat-setting the stretched, coated polyester film, wherein said coating composition, before drying and heat-setting, is a dispersion in water of a mixture consisting essentially of:

(A) 52 to 79% by weight of a copolymeric binder consisting essentially of 60 to 95% by weight of a methyl methacrylate, 3 to 20% by weight of a divinyl or diallyl monomer, 0 to 30% by weight of a plasticizing ethylenically unsaturated monomer, and 0 to 5% by weight of an ethylenically unsaturated carboxylic acid,

(B) 0.5 to 3% by weight of a water-insoluble waxy material having a melting point in the range of about 20°–100° C. and selected from vegetable waxes, insect waxes, animal waxes, mineral waxes, petroleum waxes, synthetic waxes, and wax-like longchain hydrocarbons, fatty saturated and unbranched acids and alcohols, and ethers and esters of substantially aliphatic monohydric alcohols and/or of a water-insoluble polymer consisting of repeating units corresponding to the formula:



wherein each of X, X^1, X^2, and X^3 represents hydrogen or fluorine, or each of X, X^1, and X^2 represents hydrogen and X^3 represents a methyl group,

or X represents chlorine and each of X^1, X^2, and X^3 represents fluorine,

(C) 20 to 40% by weight of an external plasticizer, said external plasticizer being wholly or almost entirely eliminated from the coating composition during the heat-setting and

(D) 0 to 5% by weight of a hydrophilic polymer.

4,132,553

COLOR PROOFING GUIDE

Stephen E. Burkle, Yonkers, and Albert S. Deutsch, Scarsdale, both of N.Y., assignors to Polychrome Corporation, Yonkers, N.Y.

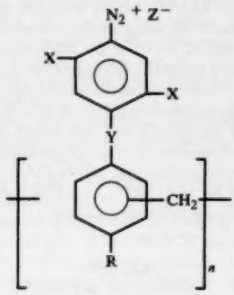
Filed Mar. 24, 1977, Ser. No. 780,948

Int. Cl.² B41N *1/14*; C07C *113/04*; G03C *1/52, 1/72*

U.S. Cl. 96—91 R **3 Claims**

1. A color proofing guide which comprises a transparent substrate having coated thereon a composition which is comprised of:

(a) A light sensitive, high molecular weight diazo polymer having the formula:



Wherein R is methyl or hydrogen

X is methoxy, ethoxy or hydrogen

Y is oxygen or sulfur

Z is an anion of a sulfonic, carboxylic or phosphonic acid

n is an integer from 8 to 970; and

(b) an organic solvent soluble carrier resin; and

(c) an organic solvent soluble dye which is non-reactant with the light sensitive polymer.

4,132,554

METHOD FOR PRODUCING A SINTERED COMPACT OF BORON NITRIDE WITH HIGH DENSITY FORM

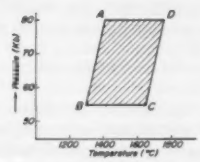
Shinroku Saito; Akira Sawaoka, both of Yokohama, and Masatada Araki, Handa, all of Japan, assignors to Nippon Oil and Fats Co. Ltd., Japan

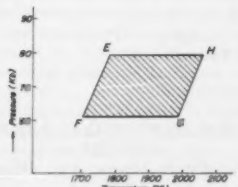
Filed Sep. 26, 1977, Ser. No. 836,723

Claims priority, application Japan, Sep. 30, 1976, 51-116491; Nov. 19, 1976, 51-139094

Int. Cl.² C04B *35/58*

U.S. Cl. 106—55 **3 Claims**





1. A method for producing a sintered compact consisting substantially of high density boron nitride having wurtzite structure, consisting of sintering a powdered mixture consisting of wurtzite-structured boron nitride obtained by the shock compression method and at least one of titanium boride, zirconium boride and hafnium boride, the amount of the boride being 2–35% by weight based on the total amount of the boride and the boron nitride, for 1–60 minutes under a temperature-pressure condition within a parallelogram formed by connecting points of A (1,400° C, 80 Kb), B(1,300° C, 55Kb), C (1,650°

C, 55 Kb) and D(1,750° C, 80 Kb) in a temperature pressure diagram, under which conditions the boride functions to suppress conversion of the wurtzite crystal structure.

2. A method for producing a sintered compact consisting substantially of very high density boron nitride having both wurtzite structure and zincblende structure in a wide mixing ratio, at least about 15% being wurtzite structure, consisting of sintering a powdered mixture of wurtzite-structured boron nitride obtained by the shock compression method and at least one of titanium boride, zirconium boride and hafnium boride, the amount of the boride being 2-35% by weight based on the total amount of the boride and the boron nitride, for 1-60 minutes under a temperature-pressure condition within a parallelogram formed by connecting points of E (1,770° C, 80 Kb), F(1,700° C, 62 Kb), G (1,980° C, 62 Kb) and H(2,050° C, 80 Kb) in a temperature-pressure diagram.

4,132,555

BUILDING BOARD

Victor E. Barrable, Gerrards Cross, England, assignor to Cape Boards & Panels Ltd., Uxbridge, England

Continuation of Ser. No. 538,197, Jan. 2, 1975, abandoned. This application Nov. 4, 1976, Ser. No. 738,688

Int. Cl.² C04B 7/02

U.S. Cl. 106—90 **15 Claims**

1. An asbestos-free building board or like product which can be used to provide a fire-resisting structure, made from a composition which comprises water-settable binder, reinforcing fibers including organic fibers and exclusive of asbestos fibers, and vermiculite in amount sufficient to confer fire-resistant properties to the product, said vermiculite being present in amount of about 12% to 50% by weight of the product.

4,132,556

REINFORCED CONGLOMERATES FOR THE CONSTRUCTION OR BUILDING INDUSTRY AND PROCESS FOR PREPARING THE SAME

Pierpaolo Camprincoli, Terni, and Luciano Rosati, Stroncone (Terni), both of Italy, assignors to Montefibre S.p.A., Milan, Italy

Filed Apr. 27, 1977, Ser. No. 791,430

Claims priority, application Italy, Apr. 28, 1976, 22770 A/76; Apr. 28, 1976, 22771 A/76

Int. Cl.² C04B 7/02

U.S. Cl. 106—90 **7 Claims**

1. Reinforced conglomerates for use in the construction industry and which are resistant to bending and cracking, said conglomerates comprising a material of the group consisting of cement, gypsum and concrete and also comprising reinforcement consisting at least predominantly of polyolefin fibers containing 5% to 30% of at least one compound selected from the group consisting of magnesium-containing silicates and oxides of metals belonging to Group II A and Group III B of the Mendelyeev Periodic Table.

4,132,557

TECHNIQUE FOR HANDLING AND TRANSPORTING CEMENT

Arthur D. Saylor, 521 E. Merced Ave., West Covina, Calif. 91790

Filed Jul. 12, 1976, Ser. No. 704,312

Int. Cl.² C04B 7/02

U.S. Cl. 106—100 **6 Claims**

1. A method of making cement available at a first geographical location when the cement components are mixed and sized at a second geographical location substantially distant from said first location, comprising the steps of:

forming a slurry of the sized and mixed cement components at the second location;

loading the slurry into a transportation vehicle at the second location;

moving the loaded transportation vehicle to the second location;

unloading the slurry from the vehicle at the first location; and

heating the slurry to such temperature and for such length of time as to convert said slurry to dry powdered cement.

4,132,558

PROCESS FOR TREATING A SLUDGE OR DRAINAGE CONTAINING CHROMIUM (VI) COMPOUNDS WITH A SOLIDIFYING AGENT

Hiroshi Uchikawa, Funabashi, and Masao Shimoda, Tokyo, both of Japan, assignors to Onoda Cement Company, Limited, Yamaguchi, Japan

Filed Aug. 10, 1976, Ser. No. 713,135

Claims priority, application Japan, Aug. 20, 1975, 50-100152

The portion of the term of this patent subsequent to Mar. 30, 1993, has been disclaimed.

Int. Cl.² C04B 7/32

U.S. Cl. 106—104 **9 Claims**

1. A process for solidifying an industrial waste sludge containing chromium (VI) compounds, comprising mixing the sludge and a rapid hardening cement consisting of from 5 to 60% by weight of 11 $CaO \cdot 7Al_2O_3 \cdot CaX_2$, where X is halogen; and 3 $CaOSiO_2$ solid solution, 2 $CaO \cdot Fe_2O_3$-6 $CaO \cdot 2Al_2O_3 \cdot Fe_2O_3$ iron solid solution and a material selected from the group consisting of anhydrous gypsum and a mixture of anhydrous gypsum and hemihydrate gypsum, in an amount such that the weight ratio of Al_2O_3/SO_3 in the cement is 0.4 to 1.8 based on SO_3.

4,132,559

STARTING MATERIAL FOR HIGH-STRENGTH HYDROTHERMALLY TREATED OBJECTS, AND A METHOD OF PRODUCING SUCH MATERIAL

Per G. Kihlstedt, Bromma, and Hedvig E. B. Hässler, Enskede, both of Sweden, assignors to Advanced Mineral Research AB, Stockholm, Sweden

Filed Apr. 26, 1977, Ser. No. 790,979

Claims priority, application Sweden, Apr. 28, 1976, 7604897

Int. Cl.² C04B 7/16

U.S. Cl. 106—117 **21 Claims**

1. A starting material for manufacturing shaped and hydrothermally hardened objects, wherein the starting material mainly comprises a mixture of

(a) material of the olivine type finely divided to a powdered product having a specific outer surface of at least approximately 25 000 cm^2/cm^3, measured in accordance with the permeability method,

(b) finely divided silica material in a quantity which is at most equal to the solid volume of said powdered product and having such a small particle size that at least a predominant portion of said silica reacts during the hydrothermal treatment process,

(c) ultra-basic rock and/or ultra-basic slag material finely divided to a particle size of 80% smaller than 200-1000 μm and comprising 50 - 80% of the total solid volume of the mixture.

4,132,560

PIGMENTED MICROPOROUS SILICA MICROSPHERES

Mark J. Marquisee, and Lionel S. Sandell, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 635,060, Nov. 25, 1975, Pat. No. 4,090,887. This application Jan. 9, 1978, Ser. No. 868,225

Int. Cl.² C04B 31/00

U.S. Cl. 106—288 B **6 Claims**

1. Pigmented silica microsphere having a diameter from 2μ to 100μ and consisting essentially of from 10% to 70% by weight of particulate pigment, based on the total weight of the microsphere, dispersed throughout a microporous silica ma-

trix, the silica matrix containing from 20% to 60% by volume of micropores, based on the total volume of the microsphere, the micropores having a median diameter from 0.004 μm to 0.05 μm.

4,132,561

INTRACHROMOSPHERULOID PIGMENTS AND PROCESSES FOR PRODUCING SAME

Oliver W. Burke, Jr., deceased, late of Fort Lauderdale, Fla. (by Norma Scala, administratrix), and Victor T. Humphreys, Pompano Beach, Fla., assignors to Marion Darrah and Joseph Y. Houghton, both of Pompano Beach, Fla.

Filed Aug. 6, 1976, Ser. No. 712,257
Int. Cl.[2] C08K *9/02, 9/04, 9/10*
U.S. Cl. 106—308 M **42 Claims**

1. A process for producing insoluble intrachromospheruloid pigment composition, which process comprises, in combination:

(a) providing in liquid medium a particulate pigment composition consisting essentially of organic color pigment composition dispersed in said medium with 0–100% by weight of the total of surface active agent material set forth in (c), said organic color pigment composition being essentially insoluble in the liquid and having primary particles of an average size less than 0.2 micron in diameter;

(b) forming an aqueous emulsion polymerization system consisting essentially of (1) the composition of (a), (2) the balance, if any, of 100% of the total of surface active agent material set forth in (c), and (3) monomer material selected in a ratio of said monomer material to said pigment composition lying in the range of 100:1 to 1:20 by weight, said monomer material consisting essentially of ethylenically unsaturated monomer material selected from the class consisting of (i) monomers polymerizable through a single ethylenically unsaturated group in the amount of 0% to 99.8% by weight of said monomer material and (ii) monomers polymerizable through a plurality of ethylenically unsaturated groups in an amount, in the range of 0.2 to 100% by weight of said monomer material, sufficient to produce polymer cross-linked to essential insolubility in any physical solvent and (4) emulsion polymerization initiator in an effective amount in the range of 0.2% to 10% by weight of the said monomer material, dispersed in an aqueous medium;

(c) the ratio of the total of the surface active agent material present after (b) to said particulate pigment composition and monomer material lying in the range of 2:1 to 1:40 by weight, and said total of surface active agent material being selected from the class of polymeric and nonpolymeric surface active agents and combinations thereof capable of effecting emulsion polymerization in the said system of the selected ethylenically unsaturated monomer material to yield polymer particles with the organic pigment provided in step (a) embedded therein,

(d) effecting polymerization in said system at sufficient temperatures in the range of 0 to 200° C. for sufficient time in the range of a few minutes to 24 hours to permit the polymerization to proceed far enough in the range from 50 to 100% conversion by weight of said monomer material to produce in aqueous dispersion an intrachromospheruloid pigment consisting essentially of spheruloids of organic polymer material, crosslinked to essential insolubility in any physical solvent, having primary particles of an average size not exceeding 4 microns in diameter, and having embedded in said spheruloids the still smaller size particles of said particulate pigment composition, and

(e) recovering said intrachromospheruloid pigment composition.

4,132,562

INTRACHROMOSPHERULOID/INORGANIC PIGMENT COMPOSITIONS AND PROCESSES FOR PRODUCING SAME

Oliver W. Burke, Jr., deceased, late of Fort Lauderdale, Fla. (by Norma Scala, administratrix), and Victor T. Humphreys, Pompano Beach, Fla., assignors to Marion Darrah and Joseph Y. Houghton, Co-trustees, both of Pompano Beach, Fla.

Filed Aug. 6, 1976, Ser. No. 712,255
Int. Cl.[2] C08K *9/02, 9/04, 9/10*
U.S. Cl. 106—308 M **41 Claims**

1. A process for producing insoluble intrachromospheruloid/inorganic pigment composition, which process comprises, in combination:

(a) providing in liquid medium a particulate color pigment composition consisting essentially of organic color pigment composition dispersed in said liquid medium with 0–100% by weight of the total of surface active agent material set forth in (c), said organic color pigment composition being essentially insoluble in water and having primary particles of an average size less than 0.2 micron in diameter;

(b) forming an aqueous emulsion polymerization system consisting essentially of (1) the composition of (a), (2) the balance, if any, of 100% of the total of surface active agent material set forth in (c), (3) monomer material selected in the ratio of said monomer material to said pigment composition lying in the range of 100:1 to 1:20 by weight, said monomer material being ethylenically unsaturated monomer material selected from the class consisting of (i) monomer material polymerizable through a single ethylenically unsaturated group in the amount of 0% to 99.8% by weight of said added monomer material and (ii) monomer material polymerizable through a plurality of ethylenically unsaturated groups in an amount, in the range of 0.2 to 100% by weight of said added monomer material, sufficient to produce polymer cross-linked to essential insolubility in any physical solvent and (4) emulsion polymerization initiator in an effective amount in the range of 0.2 to 10% by weight of the said added monomer material, dispersed in an aqueous medium;

(c) the ratio of the total of the surface active agent material present after (b) to said particulate pigment composition and monomer material lying in the range of 2:1 to 1:40 by weight, and being capable of effecting emulsion polymerization of the selected ethylenically unsaturated monomer material to yield polymer particles with the pigment provided in step (a) embedded therein;

(d) effecting emulsion polymerization of the combination formed in (b) under agitation and at sufficient temperatures in the range of 0 to 200° C. for sufficient time in the range of a few minutes to 24 hours to permit the polymerization to proceed far enough in the range from 50 to 100% conversion by weight of said monomer material to produce in aqueous dispersion an intrachromospheruloid pigment consisting essentially of spheruloids of organic polymer material, cross-linked to essential insolubility in any physical solvent, having primary particles of an average size not exceeding 4 microns in diameter, and having embedded therein the still smaller size particles of said particulate pigment composition; and

(e) providing a particulate inorganic pigment combination consisting essentially of inorganic pigment composition dispersed in an aqueous medium with from 0 to 150 parts by weight of surface active agent material per 100 parts by weight of said inorganic pigment composition said inorganic pigment composition being essentially insoluble in water and having primary particles of an average size less than 2 microns in diameter;

(f) combining in a weight ratio in the range of 1:100 to 100:1, dry basis, the aqueous dispersions formed in steps (d) and (e), with from 0 to an equal weight, based on the inorganic pigment present, of pigment bonding agent material, and from 0 to an equal weight, based on the inorganic pigment

present, of nitrogenous material and destabilizing the surface active agent material present to form an aqueous slurry of intrachromospheruloid/inorganic pigment composition, and

(g) recovering said intrachromospheruloid/inorganic pigment composition.

4,132,563

INTRALEUCOSPHERULOID/ORGANIC COLOR PIGMENT COMPOSITIONS AND PROCESSES FOR PRODUCING SAME

Oliver W. Burke, Jr., deceased, late of Fort Lauderdale, Fla. (by Norma Scala, administratrix), and Victor T. Humphreys, Pompano Beach, Fla., assignors to Marion Darrah and Joseph Y. Houghton, both of Pompano Beach, Fla.

Filed Aug. 6, 1976, Ser. No. 712,256

Int. Cl.[2] C08K *9/02, 9/04, 9/10*

U.S. Cl. 106—308 M **55 Claims**

1. A process for producing insoluble intraleucospheruloid-/organic color pigment composition, which process comprises, in combination:

(a) providing in liquid medium a particulate pigment composition consisting essentially of inorganic leuco pigment composition dispersed in said liquid medium with 0–100% by weight of the total of surface active agent material set forth in (c), said inorganic pigment composition being selected from the class consisting of the inorganic opaque white pigments and the inorganic transparent white pigments having refractive indicies different from that of the cross-linked organic polymer produced by step (d), and combinations of any two or more of the foregoing, having primary particles of an average size less than 0.2 microns in diameter

(b) forming an aqueous emulsion polymerization system consisting essentially of (1) the composition of (a), (2) the balance, if any, of 100% of the total of surface active agent material set forth in (c), (3) monomer material selected in a ratio of said monomer material to said pigment composition lying in the range of 100:1 to 1:20 by weight, said monomer material being ethylenically unsaturated and being monomer material selected from the class consisting of (i) monomer material polymerizable through a single ethylenically unsaturated group in the amount of 0% to 99.8% by weight of said added monomer material and (ii) monomer material polymerizable through a plurality of ethylenically unsaturated groups in an amount, in the range of 0.2 to 100% by weight of said added monomer material, sufficient to produce polymer cross-linked to essential insolubility in any physical solvent and (4) emulsion polymerization initiator in an effective amount in the range of 0.2 to 10% by weight of the said added monomer material dispersed in an aqueous medium;

(c) the ratio of the total of the surface active agent material present after (b) to said particulate pigment composition and monomer material lying in the range of 2:1 to 1:40 by weight and said total of surface active agent material being selected from the class of polymeric and nonpolymeric surface active agents and combinations thereof capable of effecting emulsion polymerization of the selected ethylenically unsaturated monomer material to yield polymer particles with the inorganic pigment provided in step (a) imbedded therein;

(d) effecting polymerization of the combination formed in (b) at sufficient temperatures in the range of 0 to 200° C. for sufficient time in the range of a few minutes to 24 hours to permit the polymerization to proceed far enough in the range from 50 to 100% conversion by weight of said monomer material to produce in aqueous dispersion an intraleucospheruloid pigment consisting essentially of spheruloids of organic polymer material, crosslinked to essential insolubility in any physical solvent, having primary particles of an average size not exceeding 4 microns in diameter, and having embedded therein the still smaller size particles of said inorganic particulate pigment composition;

(e) providing a particulate organic color pigment combination consisting essentially of organic color pigment composition dispersed in an aqueous medium with from 0 to 150 parts by weight of surface active agent material per 100 parts by weight of said organic color pigment composition, said organic color pigment composition being essentially insoluble in water and having primary particles of an average size less than 0.2 micron in diameter, and said surface active agent material being selected from the class consisting of the polymeric and nonpolymeric surface active agents and combinations thereof;

(f) combining in a weight ratio in the range of 1:100 to 100:1, dry basis, the aqueous dispersions formed in steps (d) and (e), with from 0 to an equal weight, based on the organic color pigment present, of pigment bonding agent material, and from 0 to an equal weight, based on the organic color pigment present, of nitrogeneous material, and destabilizing the combination to form an aqueous slurry of intraleucospheruloid/organic color pigment composition; and

(g) recovering said intraleucospheruloid/organic color pigment composition.

4,132,564

INTRALEUCOSPHERULOID PIGMENTS AND PROCESSES FOR PRODUCING SAME

Oliver W. Burke, Jr., deceased, late of Fort Lauderdale, Fla. (by Norma Scala, administratrix), and Victor T. Humphreys, Pompano Beach, Fla., assignors to Marion Darrah and Joseph Y. Houghton, both of Pompano Beach, Fla.

Filed Aug. 6, 1976, Ser. No. 712,254

Int. Cl.[2] C08K *9/02, 9/04, 9/10*

U.S. Cl. 106—308 M **55 Claims**

1. A process for producing insoluble intraleucospheruloid pigment composition, which process comprises, in combination:

(a) providing in liquid medium a particulate pigment composition consisting essentially of inorganic leuco pigment composition dispersed in said liquid medium with 0–100% by weight of the total of surface active agent material set forth in (c), said inorganic pigment composition being selected from the class consisting of the inorganic opaque white pigments and the inorganic transparent white pigments having refractive indicies different from that of the cross-linked organic polymer produced by step (d), and combinations of any two or more of the foregoing and having primary particles of an average size less than 0.2 microns in diameter

(b) forming an aqueous emulsion polymerization system consisting essentially of (1) the composition of (a), (2) the balance, if any, of 100% of the total of surface active agent material set forth in (c), (3) monomer material selected in a ratio of said monomer material to said pigment composition lying in the range of 100:1 to 1:20 by weight, said monomer material being ethylenically unsaturated and being monomer material selected from the class consisting of (i) monomer material polymerizable through a single ethylenically unsaturated group in the amount of 0% to 99.8% by weight of said added monomer material and (ii) monomer material polymerizable through a plurality of ethylenically unsaturated groups in an amount, in the range of 0.2 to 100% by weight of said added monomer material, sufficient to produce polymer cross-linked to essential insolubility in any physical solvent and (4) emulsion polymerization initiator in an effective amount in the range of 0.2 to 10% by weight of the said added monomer material dispersed in an aqueous medium;

(c) the ratio of the total of the surface active agent material present after (b) to said particulate pigment composition and monomer material lying in the range of 2:1 to 1:40 by weight and said total of surface active agent material

being selected from the class of polymeric and nonpolymeric surface active agents and combinations thereof capable of effecting emulsion polymerization of the selected ethylenically unsaturated monomer material to yield polymer particles with the inorganic pigment provided in step (a) imbedded therein;

(d) effecting polymerizaton of the combination formed in (b) at sufficient temperatures in the range of 0° to 200° C. for sufficient time in the range of a few minutes to 24 hours to permit the polymerization to proceed far enough in the range from 50 to 100% conversion by weight of said monomer material to produce in aqueous dispersion an intraleucospheruloid pigment composition consisting essentially of spheruloids of organic polymer material crosslinked to essential insolubility in any physical solvent, having primary particles of an average size not exceeding 4 microns in diameter, and having embedded in said spheruloids the still smaller size particles of said inorganic particulate pigment composition, and

(e) recovering said intraleucospheruloid pigment composition.

4,132,565

ACCELERATOR FOR GYPSUM SLURRY

Wilfred E. Willis, Rancocas, N.J., assignor to Kaiser Cement & Gypsum Corporation, Oakland, Calif.

Filed Oct. 31, 1977, Ser. No. 847,224
Int. Cl.² C04B *11/00*
U.S. Cl. 106—315 **4 Claims**

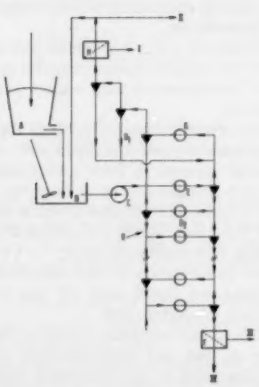
1. A process for producing an accelerator for hemihydrate gypsum comprising comminuting gypsum board to a particle size of about 100 mesh, and thereafter fine-grinding the resulting comminuted material in a ball mill to have an average particle size of about 1 micron and to have a specific surface area of about 100,000–130,000 square centimeters per gram.

4,132,566

METHOD FOR THE SEPARATION OF WHEAT GLUTEN AND WHEAT STARCH

Petrus Verberne, Hoogezand; Wilhelmus R. M. Zwitserloot, Milsbeek (L), and Robijn R. Nauta, Haren (Gr.), all of Netherlands, assignors to Scholten-Honig Research B.V., Netherlands

Filed Aug. 9, 1977, Ser. No. 823,036
Claims priority, application United Kingdom, Aug. 24, 1976, 35141/76
Int. Cl.² C13L *1/00*
U.S. Cl. 127—65 **10 Claims**



1. A method for the separation of wheat gluten and wheat starch comprising

mixing water with a wheat product selected from the group consisting of wheat flour, whole wheat meal and flaked wheat,

pumping the aqueous mixture into a hydrocyclone apparatus,

agglomerating the wheat gluten of the wheat product while in the hydrocyclone apparatus,

dividing the mixture by means of the hydrocyclone apparatus into an overflow fraction containing the agglomerated gluten and an underflow fraction containing the bulk of the starch,

said agglomerating and said dividing being done in one single step within the hydrocyclone apparatus,

separating the agglomerated gluten from the overflow fraction, and

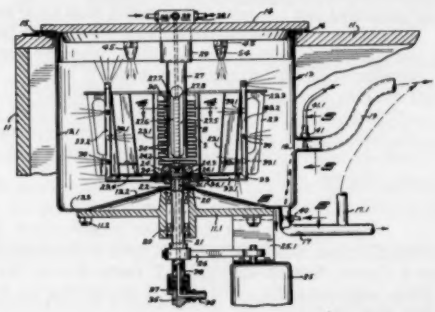
separating the starch from the underflow fraction.

4,132,567

APPARATUS FOR AND METHOD OF CLEANING AND REMOVING STATIC CHARGES FROM SUBSTRATES

Robert S. Blackwood, Chanhassen, Minn., assignor to FSI Corporation, Chaska, Minn.

Filed Oct. 13, 1977, Ser. No. 841,656
Int. Cl.² B08B *3/02, 3/10, 5/00, 6/00*
U.S. Cl. 134—1 **6 Claims**



6. A process of cleaning substrates or wafers in a closed bowl from which the atmosphere is being exhausted and liquids drained, comprising whirling the substrates while spraying the substrates with deionized water, introducing drying nitrogen gas into the bowl after such spraying has been terminated and simultaneously whirling the substrates at a significantly higher rate of speed than when being sprayed, and producing a flow of ionized nitrogen gas in the bowl after termination of water spraying and while the drying nitrogen gas is being introduced.

4,132,568

PROCESS AND COMPOSITION FOR PICKLING METAL SURFACES

David W. Irwin, 13236 Richards Dr., Strongsville, Ohio 44136

Filed Dec. 16, 1977, Ser. No. 861,114
Int. Cl.² B08B *3/08*
U.S. Cl. 134—3 **26 Claims**

1. In a process for treating metal to condition a surface thereof including providing an acid pickling bath with which the metal is in contact, said acid pickling bath containing a pickling acid which reacts with the metal to condition the surface thereof and produces hydrogen gas which forms a film on the surface of the metal which film inhibits the rate of reaction between the pickling acid and the metal, said acid pickling bath also containing a compound which liberates elemental colloidal sulfur when in said acid pickling bath which colloidal sulfur reacts with the hydrogen gas to form hydrogen sulfide and thereby decrease the amount of hydrogen film present to thereby increase the effectiveness of the pickling acid, the improvement which comprises: said acid pickling bath also containing an amount of sodium sulfite

effective to produce sodium thiosulfate in situ while the metal is in contact with said acid pickling bath whereby the colloidal sulfur is maintained at a fine particulate size to thereby increase the effectiveness of the colloidal sulfur and consequently more effectively remove the hydrogen film from the surface of the metal to thereby further increase the effectiveness of the pickling acid.

4,132,569

RUTHENIUM RECOVERY PROCESS

Raul S. DePablo, Painesville; David E. Harrington, Mentor, and William R. Bramstedt, Chardon, all of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Oct. 25, 1977, Ser. No. 845,437
Int. Cl.[2] B08B *3/08*
U.S. Cl. 134—3 **8 Claims**

1. A process for recovery of ruthenium from a coating on a catalytic or electrode substrate, comprising:

(a) stripping the ruthenium-containing coating from the substrate by immersion in a fluoboric acid stripping solution containing an amount of fluoboric acid effective to strip the coating from the substrate, wherein said ruthenium coating is flaked from the substrate and permitted to precipitate to the bottom of said solution;

(b) separating and collecting said precipitate;

(c) subjecting said precipitate to oxidation in an alkali metal hypochlorite solution containing an amount of hypchlorite effective to oxidize said ruthenium, whereby said ruthenium is oxidized to ruthenium tetroxide; and

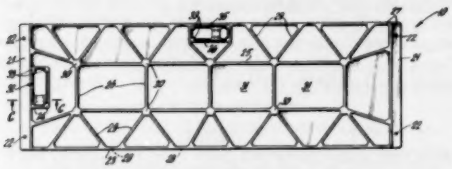
(d) distilling said ruthenium tetroxide and feeding the distilled ruthenium tetroxide into a concentrated hydrochloric acid solution containing an amount of hydrochloric acid effective to convert said distilled ruthenium tetroxide to ruthenium trichloride.

4,132,570

STRUCTURAL SUPPORT FOR SOLAR CELL ARRAY

Paul J. Caruso, Bedford, and William T. Kurth, Beverly, both of Mass., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 827,146, Aug. 24, 1977, abandoned. This application Mar. 22, 1978, Ser. No. 888,923
Int. Cl.[2] H01L *31/04*
U.S. Cl. 136—89 P **18 Claims**



1. A support structure for a solar cell array comprising:

an electrically nonconductive material having a top surface and a bottom surface, said top surface having a plurality of wells for receiving an individual solar cell in each well;

gates providing access to succeeding and adjacent wells whereby solar cells in an array supported by said structure can be electrically connected to each other;

gates providing access to terminal posts whereby a solar cell array supported by said structure can be connected to an external load;

a dike around the perimeter of said top surface for containing encapsulant on the surface of said support; and

said bottom surface having a plurality of longitudinally arranged rib stiffeners integral with said support structure and a plurality of laterally arranged rib stiffeners integral with said support structure, said rib stiffeners extending downwardly from said bottom surface of said support;

an integral skirt extending downwardly from said bottom surface around the perimeter of said support structure;

a plurality of angularly arranged rib stiffeners integral with said support structure connecting said perimeter skirt with said longitudinal support stiffeners; and,

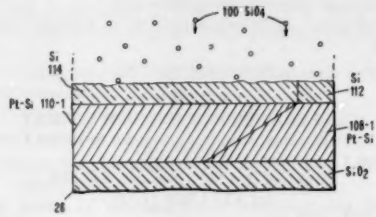
downwardly extending walls defining a junction box for electrical connectors.

4,132,571

GROWTH OF POLYCRYSTALLINE SEMICONDUCTOR FILM WITH INTERMETALLIC NUCLEATING LAYER

Jerome J. Cuomo, Bronx; Thomas H. DiStefano, Bronxville, and Robert Rosenberg, Peekskill, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 3, 1977, Ser. No. 765,497
Int. Cl.[2] B01J *17/26*
U.S. Cl. 148—1.5 **4 Claims**



1. Method for the controlled growth of a polycrystalline semiconductor material with course columnar grains comprising the steps of:

providing a metallic material, which is supported by a substrate which is unreactive with said metallic material,

said metallic material being capable of forming a first eutectic or peritectic composition at a first temperature with an intermetallic compound of said semiconductor material and said metallic material,

said metallic material being capable of forming an intermetallic compound richer in said semiconductor material than said first eutectic or peritectic composition,

said latter intermetallic compound being capable of forming a second eutectic or peritectic composition at a second temperature, which is higher than said first temperature, with said semiconductor, and

said metallic material and said semiconductor material being capable of forming a liquid in a range of temperatures between said first and second temperatures;

heating said metallic material to a temperature within said range of temperatures;

contacting said heated metallic material with a vapor comprising said first semiconductor material to form a first liquid which is unsaturated with respect to said semiconductor material;

continuing said contacting said first liquid for a time sufficient to supersaturate said first liquid with respect to said semiconductor material to form a supersaturated liquid which initiates precipitation of at least one intermetallic compound of said semiconductor material and said metallic material from said supersaturated liquid onto said substrate forming said nucleating layer;

continuing said precipitation of said nucleating layer from said supersaturated liquid until all said supersaturated liquid has been exhausted; and

continuing to hold said nucleating layer in the presence of said vapor so that said polycrystalline semiconductor material is deposited on said nucleating layer,

wherein said precipitate which forms an intermediate layer between said substrate and said polycrystalline semiconductor material, creates a Schottky-barrier with said semiconductor material.

4,132,572

COMPOSITIONS FOR TREATMENT OF METALLIC SURFACES BY MEANS OF FLUOROPHOSPHATE SALTS

Bernard Parant, Ozoir-la-Ferriere; Louis Cot, Montpellier; William Granier, Clapiers, and Jean-Henri Durand, Montpellier, all of France, assignors to The Diversey Corporation, Chicago, Ill.

Filed Apr. 21, 1977, Ser. No. 789,658
Claims priority, application France, Apr. 21, 1976, 76 11738
Int. Cl.[2] C23F *7/04, 7/12, 7/14*
U.S. Cl. 148—6.15 R 10 Claims

1. A composition at a pH of about 5 to 13, for the treatment of metal surfaces, consisting essentially of water and about 0.25 to 100 g per liter of at least one fluorophosphate salt selected from the compounds of the following formulas and hydrates thereof:

(a) $M_2^{I}PO_3F$
(b) $Li\ M^{I}PO_3F$
(c) $Na\ M^{I}PO_3F$
(d) $M^{II}PO_3F$
(e) $M_2^{I}M^{II}(PO_3F)_2$, and
(f) $M_2^{III}(PO_3F)_3$

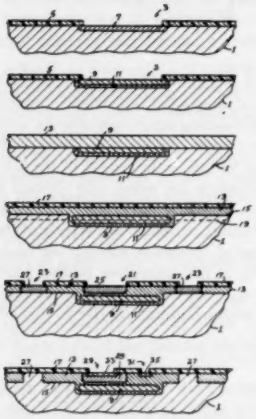
wherein M^{I} represents Na, K, Rb, Cs and NH_4, M^{II} represents Cd, Mn, Ni and Zn and M^{III} represents Cr, Fe and Al.

4,132,573

METHOD OF MANUFACTURING A MONOLITHIC INTEGRATED CIRCUIT UTILIZING EPITAXIAL DEPOSITION AND SIMULTANEOUS OUTDIFFUSION

Wolfgang Kraft, Freiburg, Germany, assignor to Murata Manufacturing Co., Ltd., Kyoto, Japan

Continuation-in-part of Ser. No. 766,652, Feb. 8, 1977, abandoned. This application Feb. 2, 1978, Ser. No. 874,592
Int. Cl.[2] H01L *21/20, 21/225, 21/74*
U.S. Cl. 148—175 4 Claims



1. A method of forming an isolated region of semiconductive material having a first type impurity in a semiconductor body of a second type of impurity, said isolated region including a highly doped buried layer of first type impurity, comprising the steps of:

diffusing a surface area of a semiconductor substrate of second type impurity with an impurity of the first type and having a first diffusion rate;

diffusing said area of the semiconductor substrate with a second impurity of the first type and having a second diffusion rate slower than the first diffusion rate;

forming an epitaxial layer over the entire surface of the semiconductor substrate, said epitaxial layer having a first type of impurity with a concentration less than that of the substrate; and

diffusing into the surface of the epitaxial layer a second type impurity into an isolating zone surrounding the region and continuing said diffusion until the impurity of the substrate outdiffuses through the epitaxial layer to meet the impurity of the isolating zone which diffuses inwardly, so that the region of first type impurity is entirely surrounded by a continuous region of second type impurity and the impurity having the first diffusion rate diffused inwardly into the substrate so that a continuous pn-junction surface is formed about the region and the impurity having the second diffusion rate forms the buried layer.

4,132,574

SUPERFINE PETN THIN LAYER SLURRY EXPLOSIVE

Charles D. Forrest, 151 La Mancha Dr., Asheville, N.C. 28805

Continuation-in-part of Ser. No. 622,319, Jan. 31, 1974, Pat. No. 3,912,560. This application Mar. 14, 1977, Ser. No. 777,315
Int. Cl.[2] C06B *45/00*
U.S. Cl. 149—2 11 Claims

1. An improved slurry explosive able to propagate in very thin layers comprising of, by weight:

A. approximately 15% to 45% by weight of sensitized superfine particle penetaerythritol tetranitrate (PETN) said sensitized particles having at least 1000 interstitial voids of apparent diameter of approximately 0.18 to 0.2 micron uniformly distributed in an average diameter particle of about 6.5 microns; and

B. approximately 45% to 27% by weight of a material selected from the group consisting of ammonium nitrate, potassium, barium, and sodium nitrate; and

C. approximately 10% by weight of a material selected from the group consisting of diethylene glycol, formamide, dimethyl formamide, glycols and alcohols; and

D. approximately 0.5% to 0.7% of a material selected from the group consisting of guar gum and polyacrylamide; and

E. a cross-linking agent; and

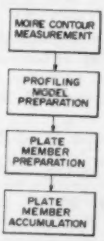
F. the balance water.

4,132,575

METHOD OF PRODUCING THREE-DIMENSIONAL REPLICA

Masane Suzuki, Omiya, and Kiyoshi Suzuki, Aego, both of Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Sep. 16, 1977, Ser. No. 833,989
Int. Cl.[2] B44C *3/00;* G03C *5/04, 5/00*
U.S. Cl. 156—58 7 Claims



1. A method of producing a three-dimensional replica of a three-dimensional object comprising producing a moire contour map of the three-dimensional object by use of a moire contour measuring system, wherein the said system includes illuminating the said three-dimensional object with light modified by a grating, and photographing the said object so illuminated with a camera utilizing another grating to record the moire contour map, preparing a profiling model which carries profiling curves representing the moire contour lines of said moire contour map from said moire contour map by contact printing the moire contour map on a photosensitive resinous

material and removing parts of the resinous material in the form of the moire contour map printed thereon by an etching process, preparing a number of plates having configurations corresponding to said moire contour lines by a profiling machine by use of said profiling model, stacking said number of plates and binding said stacked plates together.

4,132,576

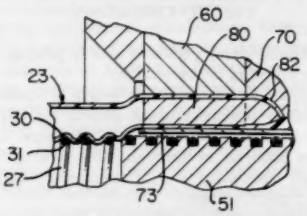
METHOD OF MAKING POLYMERIC FLEXIBLE HOSE CONSTRUCTION

Peter J. Neroni, Dayton, and Donald L. Kleykamp, Springboro, both of Ohio, assignors to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 739,874, Nov. 8, 1976, Pat. No. 4,064,355. This application Sep. 26, 1977, Ser. No. 836,880

Int. Cl.[2] B29D *23/05;* **F16L** *11/12*

U.S. Cl. 156—143 **6 Claims**



1. A method of making a polymeric flexible hose construction comprising, extruding a tubular wall over a continuous longitudinally extending helically coiled reinforcing member, said wall defining a main longitudinally extending passage for conveying a fluid therethrough, shrinking said wall against said reinforcing member to define a plurality of axial convolutions in said wall defined by a continuous longitudinally extending helical convolution corresponding to said reinforcing member, extruding a wall of substantially C-shaped cross-sectional configuration and having open end edges, heat fusing said end edges against said tubular wall to define a second longitudinally extending passage for electrical conductor means, said second passage having a wall portion common with said tubular wall, and cooling said tubular wall and C-shaped wall.

4,132,577

PROCESS FOR PRODUCING HOLLOW PROFILED STRUCTURES, AND STRUCTURES PRODUCED THEREBY

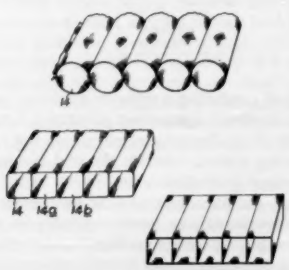
Erich Wintermantel, 10 Elsa-Brandströmstrasse, 5300 Bonn-Bad Godesberg, Fed. Rep. of Germany

Filed Jun. 14, 1976, Ser. No. 695,960

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1975, 2529185

Int. Cl.[2] B29C *1/08, 17/06;* **B32B** *3/20, 3/22*

U.S. Cl. 156—156 **5 Claims**



1. A method of making a hard multi-tubular structure which comprises: producing a flat hose fabric composed of a plurality of side-by-side abutting hoses, introducing uninflated foil tubes of thermoplastic shrink film into each of the hoses of the fabric, the tubes being of substantially the same length as the length of the fabric, inflating the tubes for expanding the hoses into formed hollow sections, treating the fabric with a hardening material, allowing hardening of the hardening material and setting of the fabric with the hoses in expanded condition, and leaving the tubes after setting of the hose fabric in the respective hollow sections free of any internal inflating pressure, and heating the resultant structure for the creation of perforations in the shrink film.

2. A method of making a hard multi-tubular structure which comprises: producing a flat hose fabric composed of a plurality of side-by-side abutting hoses, introducing uninflated foil tubes into each of the hoses of the fabric, the tubes being of substantially the same length as the length of the fabric, initially expending the hoses into circular cross section configurations, inflating the tubes for expanding the hoses into formed hollow sections, treating the fabric with a hardening material, allowing hardening of the hardening material and setting of the fabric with the hoses in expanded condition, after a partial setting of the fabric compressing the hoses each into substantially rectangular cross-section, and leaving the tubes after setting of the hose fabric in the respective hollow sections free of any internal inflating pressure.

4. A method of making a hard multi-tubular structure which comprises: producing a flat hose fabric composed of a plurality of side-by-side abutting hoses, introducing uninflated foil tubes each of the hoses of the fabric, the tubes being of substantially the same length as the length of the fabric, inflating the tubes for expanding the hoses into formed hollow sections, treating the fabric with a hardening material, allowing hardness of the hardening material and setting of the fabric with the hoses in expanded condition, leaving the tubes after setting of the hose fabric in the respective hollow sections free of any internal inflating pressure and applying to the fabric in its set condition a covering which engages through the interstices the threads of the hose fabric to anchor the covering mechanically to the hose fabric.

5. A method of making a hard multi-tubular structure which comprises: producing a flat hose fabric composed of a plurality of side-by-side abutting hoses, introducing uninflated foil tubes into each of the hoses of the fabric, the tubes being of substantially the same length as the length of the fabric, inflating the tubes for expanding the hoses into formed hollow sections, treating the fabric with a hardening material, allowing hardening of the hardening materials and setting of the fabric with the hoses in expanded condition, leaving the tubes after setting of the hose fabric in the respective hollow sections free of any internal inflating pressure, and filling the interiors of the hollow sections with a material similar to that of the covering.

4,132,578

PLASTIC PIPE WELDING APPARATUS AND METHOD

Harold A. Gell, Jr., 13720 Lockdale Rd., Silver Spring, Md. 20906

Filed Oct. 15, 1976, Ser. No. 732,984

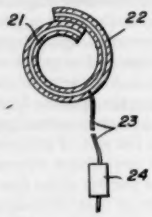
Int. Cl.[2] B65H *69/02;* **B29C** *19/00*

U.S. Cl. 156—158 **3 Claims**

1. A method of welding a plastic pipe which includes the steps of:

bringing together two separate pieces of plastic pipe to be welded to form a splice; placing a bimetallic clamp about

said splice; and applying heat to said bimetallic clamp in sufficient quantities to cause said bimetallic clamp to



tighten about said splice and to cause the plastic thereunder to fuse.

4,132,579

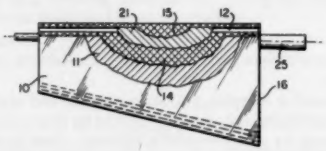
GOLF SHAFT AND METHOD OF MAKING SAME

Richard L. VanAuken, 1000 Papau Rd., Sommerville, N.J. 08876, assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 508,884, Sep. 24, 1974, Pat. No. 4,023,801. This application Feb. 22, 1977, Ser. No. 771,015

Int. Cl.² B65H *81/00*

U.S. Cl. 156—189 **5 Claims**



1. A method of forming a tubular golf shaft having narrow range bending and torsional deflections from a sheet of unidirectional resin impregnated graphite fiber and a sheet of woven glass fabric comprising the steps of:

cutting said sheet of resin impregnated unidirectional graphite fiber to a predetermined flat pattern constituting a first layer having the fibers oriented at an angle ranging from about $+13°$ to $+26°$ with respect to the major axis of the predetermined flat pattern;

cutting said sheet of glass cloth to the same predetermined flat pattern and the same size as said resin impregnated fiber sheet and having the fibers of the cloth oriented at an angle ranging from about $\pm 40°$ to about $\pm 50°$ with respect to the major axis of the pattern, thereby forming a third layer;

cutting said resin impregnated unidirectional fiber sheet material to the same predetermined flat pattern and the same size of said first layer thereby forming a second layer, said second layer having the fibers oriented at an angle ranging between about $-13°$ to about $-26°$ with respect to the major axis of the predetermined flat pattern;

arranging said glass and fiber layers in alternating fashion with the glass layer interposed between the graphite fiber layers thereby forming an oblong blank of laminated material;

wrapping said oblong blank of laminated material around a mandrel;

heating said assembly of wrapped laminated material and mandrel to a temperature sufficient to cause the resin in the layers to fuse, thereafter allowing the fused material to cool and removing the mandrel.

4,132,580

METHOD OF MAKING CARD CLOTHING WITH A REINFORCING BACK

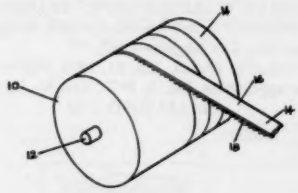
Graham R. Booth, Brighouse; John S. Smith, Rawdon, near. Leeds, and Malcolm Clayton, Huddersfield, all of England, assignors to The English Card Clothing Company Limited, Huddersfield, England

Continuation of Ser. No. 510,790, Sep. 30, 1974, abandoned. This application Jul. 12, 1976, Ser. No. 704,745

Claims priority, application United Kingdom, Oct. 4, 1973, 46295/73

Int. Cl.² B29G *7/00*; B29D *3/02*

U.S. Cl. 156—193 **6 Claims**



1. A method of manufacturing an arcuate card-clothed element having carding teeth on its inner concave surface and adapted for operation in a textile machine comprising the steps of laying card-clothing on the convex surface of an arcuate former with the teeth of said card clothing projecting inwardly toward said former, providing an initially deformable sustaining element which is capable of being permeated by fluent bonding agent with an imparted shape including a concave surface substantially corresponding to the outside contour of the card clothing on the former and applying said sustaining element with said concave surface in backing relation to the card clothing on the former, and introducing a curable bonding agent for permanently bonding said sustaining element to the outside of said card-clothing while at the same time introducing some of the bonding agent to penetrate said sustaining element and curing said agent for stiffening the sustaining element while said card-clothing is on said former to fix the sustaining element to the card-clothing and maintain the shape of the card-clothing imparted by the former.

4,132,581

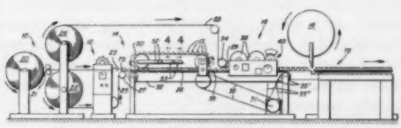
METHOD FOR THE FABRICATION OF PLASTICBOARD

Henry D. Swartz, Chestnut Hill, Mass., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Dec. 27, 1976, Ser. No. 754,504

Int. Cl.² B31F *1/22*; C09J *5/00*

U.S. Cl. 156—208 **9 Claims**



1. A process for manufacturing a single faced corrugated plasticboard comprising:

(1) forming a corrugated web,

(2) heating selectively by means of resistive heating to a heat fusion temperature apexes from within corrugations of said corrugated web,

(3) solidifying under pressure a first web in contact with said apexes; wherein said first web and said corrugated web are in continuous motion throughout steps (1) to (3).

3. A process for manufacturing a two faced corrugated plasticboard comprising:

(1) heating selectively by means of resistive heating apexes

from within corrugations of a first side of a corrugated web to a melt fushion temperature,

(2) solidifying under pressure said apexes on a first side of said corrugated web in contact with a first web melt fusible thereto,

(3) heating a second web,

(4) contacting said second web and apexes on a second side of said corrugated web, and

(5) solidifying under pressure said second web in contact with said corrugated web; wherein all webs are in continuous motion during steps (1) to (5).

4,132,582

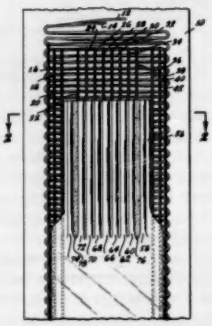
METHOD OF MAKING CARPET SEAMING TAPE

Alexander Winkler, North Hollywood, Calif., assignor to Bruck Industries, Inc., Los Angeles, Calif.

Division of Ser. No. 45,432, Jun. 11, 1970, Pat. No. 3,755,058. This application Jun. 5, 1972, Ser. No. 259,620

Int. Cl.[2] **B29D** *9/02*

U.S. Cl. 156—209 **7 Claims**



1. A method of fabricating a carpet seaming tape, comprising the steps of:

securing the back surface of a woven tape of seaming yarns to the top surface of a band of backing material by an emulsion applied to the back of said seaming yarns, said emulsion being operable to prevent said seaming yarns from sliding around on said backing material and being a heat sealant;

applying a layer of thermoplastic adhesive material in a continuous layer to the top surface of said yarn tape to fill the interstices therewith, said thermoplastic adhesive material being applied to said yarn tape in its hot melted state; and

embossing rows along the length of said carpet seaming tape in the layer of thermoplastic adhesive material while in its melted state with a chilled embossing tool thereby to prevent said thermoplastic adhesive material from sticking thereto during the embossing step and press said thermoplasic adhesive material into a secure bond with said backing material.

4,132,583

LABEL APPLICATOR

William S. Hodgson, Hingham, Mass., assignor to South Shore Machine Company, Inc., Braintree, Mass.

Continuation of Ser. No. 733,222, Oct. 18, 1976, abandoned, which is a continuation of Ser. No. 533,503, Feb. 21, 1975, abandoned. This application Mar. 17, 1978, Ser. No. 887,549

Int. Cl.[2] **B44C** *1/00;* **B65C** *9/14*

U.S. Cl. 156—351 **7 Claims**

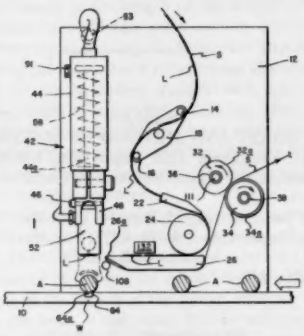
1. A label applicator for applying individual labels from a strip to an article at a labelling position, said label applicator comprising:

A. a stripper plate having a knife edge that is displaced from the labelling position,

B. means for advancing the strip carrying the labels spaced along the strip over the knife edge so that the labels separate from the strip at the knife edge,

C. a reciprocal pressure foot spaced opposite from the stripper plate knife edge and mounted to the applicator for reciprocal motion and for arcuate motion,

D. means for swinging the pressure foot simultaneously with the operation of said strip advancing means from a first position at which the axis of reciprocation intersects the labelling position toward the stripper plate to a second position wherein a portion of the foot overlies the stripper plate and is cocked so that the leading edge of each separating label engages the foot at an angle whereby the label is positioned accurately laterally relative to the foot,



E. means for temporarily adhering the label to the pressure foot,

F. means for stopping said strip advance and simultaneously for returning the pressure foot to its first position,

G. means for reciprocating the pressure foot in its first position so that the foot extends momentarily and presses the label against an article placed in its path at the labelling position, and

H. means for producing first, second and third signals in sequence during a labelling operation, the first signal causing the reciprocating means to extend the pressure foot and apply to the article a label that was obtained during a previous labelling operation and the second and third signals energizing, respectively, the swing means and the stopping means whereby the applicator retrieves a label for a next labelling operation.

4,132,584

MACHINE FOR MANUFACTURING FLAT-BOTTOMED BOTTLES

Samuel S. Aidlin, 214 Beaumont St., Brooklyn, N.Y. 11235, and Stephen H. Aidlin, 934 Glenwood Rd., W. Hempstead, N.Y. 11552

Filed Nov. 29, 1977, Ser. No. 855,799

Int. Cl.[2] **B65C** *9/00, 11/04*

U.S. Cl. 156—500 **12 Claims**

1. A machine for producing plastic bottles with substantially flat undersides by bonding round-bottomed preshaped hollow plastic container members to complementary substantially flat-bottomed base members, comprising:

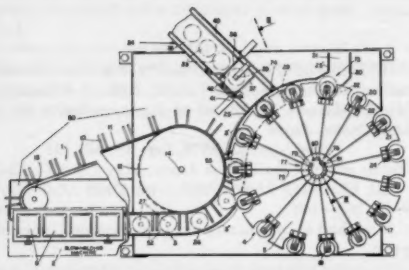
a generally horizontally moving transporter provided with seats for said base members and with holders for said container members above said seats;

first conveyor means extending from a supply of said container members to a loading station adjacent said transporter for successively inserting a series of container members into respective holders thereof;

second conveyor means extending from a supply of said base

members to a feeding station adjacent said transporter for successively depositing a series of base members on respective seats thereof in line with the inserted container members, with a lower contact surface of each container member confronting a complementary upper contact surface of the aligned base member;

applicator means coacting with one of said conveyor means for coating one of said contact surfaces with a bonding agent preparatorily to emplacement of each member of the corresponding series on said transporter;



clamping means on said transporter operable upon emplacement of aligned container and base members for pressing them together at said contact surfaces thereof during hardening of said bonding agent to produce a finished workpiece;

extraction means at an unloading station downstream of said loading and feeding stations for removing successive workpieces from said transporter; and

drive means for synchronously operating said transporter, said first and second conveyor means and said clamping means.

4,132,585

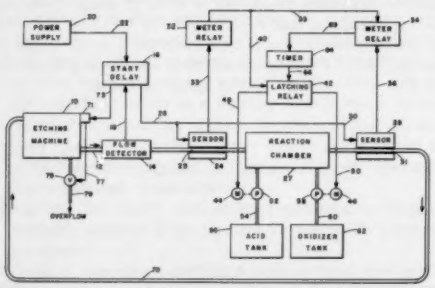
METHOD OF AUTOMATICALLY MONITORING AND REGENERATING AN ETCHANT

Keith E. Oxford, 4010 Paducah Dr., San Diego, Calif. 92117

Division of Ser. No. 614,072, Sep. 17, 1975, abandoned. This application Apr. 4, 1977, Ser. No. 784,237

Int. Cl.[2] C23F *1/00*; G01N *21/26*

U.S. Cl. 156—626 **8 Claims**



7. A method of automatically monitoring the condition of an etchant in an etching machine and regenerating the same comprising the steps of:

circulating a quantity of etchant along a flow path,

monitoring at a first position along the flow path the changes in etchant composition to determine the condition of deficiency of the etchant,

adding a first constituent component to regenerate the etchant to a predetermined etching vigor,

monitoring the etchant after the addition of the constituent component to determine if the constituent component addition is causing a cure of the defeciency,

monitoring said etchant downstream of said addition of said first constituent, and

discontinue the addition of said first constituent upon failure to detect an improvement and initiate the addition of a second constituent component.

4,132,586

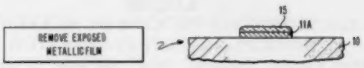
SELECTIVE DRY ETCHING OF SUBSTRATES

Paul M. Schaible; Geraldine C. Schwartz, both of Poughkeepsie, N.Y., and Laura B. Zielinski, New Fairfield, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1977, Ser. No. 862,262

Int. Cl.[2] C23F *1/02*

U.S. Cl. 156—643 **16 Claims**



1. A process for selective removal of material from a substrate comprising:

forming a superimposed mask of magnesium oxide on a surface of a substrate exposing discrete areas of said surface, and

removing material from said masked substrate at said exposed discrete areas.

4,132,587

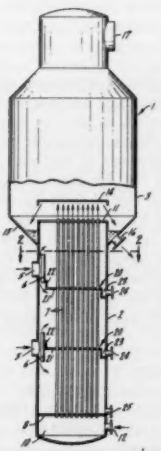
EVAPORATOR

Henry G. Lankenau, New Providence, and Alfonso R. Flores, Westfield, both of N.J., assignors to Ecodyne Corporation, Lincolnshire, Ill.

Filed May 23, 1977, Ser. No. 799,817

Int. Cl.[2] B01D *1/06*

U.S. Cl. 159—27 A **2 Claims**



1. Apparatus for evaporating liquids comprising: a chamber having an inlet for hot vapors, an outlet adjacent the bottom of said chamber for discharge of condensed vapors, a plurality of cylindrical vertical tubes of relatively small diameter occupying said chamber so that said vapors contact the outside surface thereof, means for passing liquid through said vertical tubes, said liquid being heated and at least partially vaporized by heat transfer from said vapors which are condensed as a film which

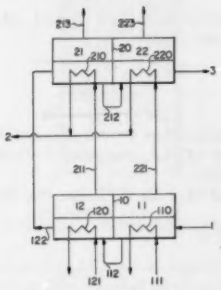
flows down the outside of said vertical tubes, means for receiving said heated liquid and its vapors, and horizontal plate means perpendicular to said vertical tubes, said horizontal plate having holes therein receiving and contacting said vertical tubes in liquid-tight maner so as to prevent any condensed vapors from continuing to flow beyond said horizontal plate means, said horizontal plate means being located above said outlet for removing the condensed vapors from said tubes so as to reduce the average thickness of said film and thereby increase the heat transferred between said hot vapors and liquid, said horizontal plate means being sealed at its edges to the inside wall of said chamber, an integral upstanding end wall of said horizontal plate means extending below the plate means defining a trough with the inside wall of the chamber for collecting condensed vapors from the plate means, said trough communicating with an intermediate condensate outlet for withdrawing condensate from the chamber at a level above said outlet adjacent the bottom of said chamber.

4,132,588

CONCENTRATION PROCESS BY MULTISTAGE, MULTIPLE EFFECT EVAPORATOR

Shinsaku Ogawa, Nobeoka, Japan, assignor to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 31, 1977, Ser. No. 764,471
Claims priority, application Japan, Feb. 6, 1976, 51-11231
Int. Cl.[2] B01D *1/26*
U.S. Cl. 159—47 R **9 Claims**



1. In a multiple effect evaporation system for the concentration of liquids containing a solute in a solution wherein the vapor from each effect is used to heat the liquid in the next subsequent effect, the improvement which comprises dividing each effect into a number of successive stages through which the liquid flows in the direction of increasing concentration, each stage being provided with heating means, and utilizing the vapors selected from the stages in one effect as said heating means to heat the liquid in each stage in the next subsequent effect; said vapors being selected so that the vapors from the stages in one effect are utilized in order of decreasing concentration of solute in the solution to heat the liquids in the next subsequent effect in order of increasing concentration of solute in solution.

4,132,589

DELIGNIFICATION AND BLEACHING OF CELLULOSE PULP

Per K. Christensen, Henrik Angells gt. 31, 7000 Trondheim, Norway

Filed Apr. 14, 1975, Ser. No. 568,055
Claims priority, application Norway, Apr. 17, 1974, 741375
Int. Cl.[2] D21C *9/10*
U.S. Cl. 162—65 **3 Claims**

1. A process for delignification and bleaching of cellulose pulp comprising the steps of admixing unbleached sulphite cellulose pulp with a base consisting of a finely divided, solid magnesium compound selected from the group consisting of magnesium oxide, magnesium hydroxide and magnesium peroxide, and contacting the admixture at a pulp consistency of 3–50% with oxygen gas at elevated pressure at a temperature in the range of 90°–160° C for 0.5–6 hours in the absence of alkali metal hydroxide.

4,132,590

METHOD OF PRODUCING INORGANIC BOARDS

Hirofumi Yamada; Noboru Takaki, both of Amagasaki, and Michio Masuda, Osaka, all of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Mar. 23, 1978, Ser. No. 889,533
Claims priority, application Japan, May 13, 1977, 52-55763
Int. Cl.[2] D21F *11/00*; F26B *5/04*; C04B *1/00, 15/14*
U.S. Cl. 162—145 **7 Claims**

1. A method for producing inorganic boards, comprising the steps of

(A) forming inorganic boards from a water slurry containing inorganic materials;

(B) placing the boards in an autoclave and supplying saturated steam under pressure of between 2 and 12 kg/cm^2, at a temperature of about 120 to 190° C., for a period of time of from 8 to 16 hours, thereby to harden said boards; and

(C) subjecting the hardened boards to one or more drying cycles consisting essentially of the sequential steps of

(i) subjecting the boards to a vacuum of 60 to 300 Torrs in the same autoclave for a period of time sufficient to enable the core of the boards to reach a predetermined temperature, and

(ii) subjecting the boards to saturated steam in the same autoclave, at a pressure of from 2 to 12 Kg/cm^2, at a temperature within the range of 120 to 190° C., and for a period of time sufficient to enable the core of the boards to reach a predetermined temperature,

thereby stepwisely reducing the moisture content of the boards to a value desired.

7. The method of claim 1, wherein said boards are produced by a paper making process, employing a slurry made from a predetermined quantity of water, 1 to 10 weight parts of monocarboxylic acid salt of light metal; and 100 weight parts of raw materials consisting essentially of 15 to 55 weight parts silicic acid type material, lime type material of 0.4 to 1.2 molar times the quantity of silicic acid type material, 2 to 20 weight parts cement, 5 to 25 weight parts asbestos, 1 to 15 weight parts pulp, and 0.05 to 0.5 weight part of synthetic fibers.

4,132,591

MOLDING PROCESSES FOR MAKING MULTILAYER CONTAINERS OF DIFFERENT MATERIALS

John C. Merges, Jr., Glen Mills, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Continuation-in-part of Ser. No. 594,146, Jul. 7, 1975, abandoned. This application Jul. 28, 1977, Ser. No. 819,903
Int. Cl.[2] D21F *11/00*
U.S. Cl. 162—146 **5 Claims**

1. A pulp molding process for making a multilayer container comprising:

(a) forming at least one shaped inner layer consisting of water dispersible polyolefin fibers from a water slurry of

said fibers on a container forming means wherein the amount of the fibers is in the range of about 16 weight % to about 50 weight % of the total weight of resulting container;

(b) forming juxtaposed to the inner shaped layer at least one outer layer of a mixture of cellulosic fibers and polyolefin fibers form a water slurry of said mixture of fibers wherein the amount of the fibers in the mixture is in the range of about 10 weight % to about 90 weight %;

(c) removing resulting multilayer formed shape container from the forming means and removing any remaining water contained in the multilayer formed shape container; and

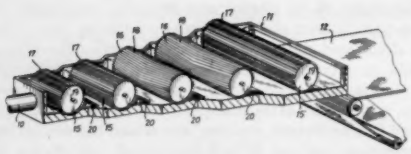
(d) subjecting the removed multilayer formed shape container to sufficient heat and pressure to fuse the polyolefin fibers of the inner layer into a liquid barrier and to fuse the polyolefin fibers of the cellulosic layer to the inner layer.

4,132,592

ENTANGLED NON-WOVEN WEB-FORMING APPARATUS

Ralph E. Brandon, Lewisburg, Pa.; Michael Ring, and James B. Morris, both of Warwick, N.Y., assignors to International Paper Company, New York, N.Y.

Filed Feb. 22, 1977, Ser. No. 770,690
Int. Cl.² D21F *1/02*
U.S. Cl. 162—216 **8 Claims**



8. A process for uniformly dispersing long crimped fibers in a high viscosity medium and depositing the dispersion onto a web former as a uniformly dispersed, three-dimensional network of loosely entangled fibers, the process comprising

delivering the fibers, having a length of about 2 inches, in a fiber/medium slurry as a flowing stream into a laterally divergent channel, the greatest thickness of said stream of slurry being at the slurry entry end of said channel and said stream of slurry being wider and thinner adjacent the slurry exit end of said channel;

contacting the slurry with at least one first rotating roll rotatably secured in the channel for uniformly dispersing the fibers;

contacting the dispersed fibers with at least one second rotating roll rotatably secured in the channel for uniformly spreading the dispersed fibers throughout the channel;

moving the dispersion to the exit end of the channel; and

depositing the dispersion onto the web former.

4,132,593

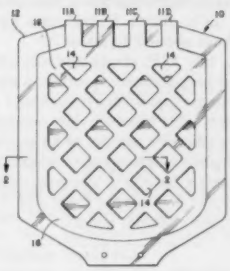
Patent Not Issued For This Number

4,132,594

GAS DIFFUSION LIQUID STORAGE BAG AND METHOD OF USE FOR STORING BLOOD

Herman Bank, Altadena, and Edward L. Cleland, Duarte, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 28, 1976, Ser. No. 700,467
Int. Cl.² A61M *1/03;* A61J *1/00;* B65D *81/24, 81/00*
U.S. Cl. 195—1.8 **17 Claims**



1. A method of storing blood which has been treated with a selected compound to extend the useful life of the blood, said treatment resulting in the subsequent production of CO_2, the method comprising the steps of:

providing a closeable plastic bag adapted to contain a preselected quantity of treated blood, the bag having first wall portions of a thickness chosen to enable CO_2 to diffuse through said portions at a selected predetermined rate so as to maintain the pH of said treated blood within a selected range, said bag having second wall portions for providing strength for said bag to withstand pressure applied thereto at least by the stored blood; and

storing the treated blood in said bag.

2. A system for the storage of a liquid within a closed bag wherein a predetermined gas is formed, and for controlling a selected characteristic of said liquid, which is related to the content of said gas in said bag, said system comprising:

a bag having semi-permeable wall means including thin wall means of preselected thickness for enabling said gas to diffuse through said thin wall means at a selected rate, to thereby control the selected characteristic of said liquid, said wall means including reinforcing means for enabling said bag to withstand pressure, wherein said reinforcing means comprises a spaced ribbing of the same material as the material of said thin wall means and which is integral therewith and of a thickness sufficient to reinforce said bag and the ratio of the surface area of said thin wall means to the total surface area of said bag is preselected to control the characteristic of said liquid by controlling the rate of diffusion of said gas through said thin wall means.

5. A system for storing whole blood or red blood cells which has been treated to extend its usable life, which treatment results in the production of CO_2 and requires the removal of CO_2 at a predetermined rate, so as to maintain the pH of the blood or the red blood cells within a selected range, said system comprising:

a bag having semi-permeable wall means including thin wall means of preselected thickness for enabling CO_2 to diffuse through said wall means at a selected rate, said wall means including reinforcing means juxtaposed with said thin wall means for enabling said bag to withstand pressure, the ratio of the surface area of said thin wall means, which do not include said reinforcing means, to the total surface area of said wall means being selected to control the rate of diffusion of the CO_2 through said thin wall means so that the pH of the blood or the red blood cells in said bag is maintained within said selected range.

4,132,595

DEXTROSE PRODUCTION WITH IMMOBILIZED GLUCOAMYLASE

Ronald E. Hebeda; Dennis J. Holik, both of Naperville, and Harry W. Leach, Willowbrook, all of Ill., assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed Dec. 13, 1976, Ser. No. 750,035
Int. Cl.[2] C12D *13/02*
U.S. Cl. 195—31 R 12 Claims

1. A process for the production of dextrose from starch which comprises the steps of:

(a) reacting starch with hydrolytic enzymes or acid to produce a low D.E. starch hydrolysate having a dextrose equivalent from about 2 to about 20;

(b) treating the low D.E. starch hydrolysate with a soluble glucoamylase preparation to produce a starch hydrolysate having a dextrose equivalent from about 30 to about 85;

(c) reacting the soluble glucoamylase-treated starch hydrolysate with an effective amount of an enzyme consisting of immobilized glucoamylase under conditions to produce a dextrose product having a dextrose content of at least about 93 percent dry weight basis; and

(d) recovering said dextrose product.

4,132,596

SUPPORT-AMINOACYLASE COMPLEXES

François Meiller, Palaiseau, and Bernard Mirabel, Fresnes, both of France, assignors to Rhone Poulenc Industries, Paris, France

Filed May 20, 1977, Ser. No. 799,117
Claims priority, application France, May 26, 1976, 76 15984
Int. Cl.[2] C07G *7/02*
U.S. Cl. 195—63 8 Claims

1. Stable support-aminoacylase complexes having an enzymatic activity, consisting of aminoacylase adsorbed on a support in the form of an inorganic porous substance selected from the group consisting of a metal oxide and silica having a grain size between 4 μm and 5 mm, a specific surface of the order of 5 to 150 m^2/g, a pore diameter of 500 to 2500 A, a pore volume of 0.4 to 2 ml/g, and coated in an amount of less than 10 mg/m^2 without blocking the pores of the support, with a film of cross-linked polymer containing or bearing groups selected from the group consisting of tertiary amine and quaternary ammonium salts in which the functional groups are from the group consisting essentially of

$$-CH_2-\underset{\displaystyle R}{\overset{\displaystyle |}{N}}-CH_2-$$

or $-CH_2-N^{(\pm)}(R)_3\,X^{(-)}$, in which R, which may be identical or different, represents an alkyl or hydroxyalkyl group having 1 to 4 carbon atoms and X is an inorganic or organic anion.

4,132,597

METHOD FOR CULTIVATION OF BACTERIA

Endre Kvanta, Angelholm, Sweden, assignor to AB Medipharm, Brogatan, Sweden

Filed Jun. 9, 1976, Ser. No. 694,219
Int. Cl.[2] C12K *3/00*; C12B *1/08, 1/00*
U.S. Cl. 195—96 4 Claims

1. A method for cultivating fast growing bacteria and their stable metabolities in order to reach optimal cultivating time comprising:

choosing a volume of inoculum including the bacteria sought to be cultivated according to the following equation:

$$a = V \cdot n/2^t$$

where

a = volume of inoculum in liters

V = cultivating medium's total volume in liters

n = bacterium strain's generation time in hours

t = cultivating time in hours;

introducing said volume of inoculum and a quantity of nutriment containing a nitrogen source, growing factors, a carbon source, and a pH-stabilizer, into a fermentor therby obtaining the total volume of cultivating medium V; cultivating said bacteria by maintaining said inoculum and said nutriment in contact within said fermentor for a time t whereby a grown cultivating medium is obtained which includes a mass of the desired bacterium, wherein said volume of inoculum is introduced into said fermentor by causing bacteria to grow in said fermentor in the presence of a quantity of nutriment containing a nitrogen source, growing factors, a carbon source, and a pH-stablizer, and pouring off grown cultivating medium when the exponential growing phase has finished and the stationary phase of growth has begun, the quantity of medium poured off being such that the desired volume of inoculum remains.

4,132,598

STABILIZED LIQUID PHOSPHATE CONTAINING DIAGNOSTIC COMPOSITIONS AND METHOD OF PREPARING SAME

Ivan E. Modrovich, 1043 Mes Dr., Camarillo, Calif. 93010

Filed Jun. 3, 1977, Ser. No. 803,036
Int. Cl.[2] C12B *1/00*
U.S. Cl. 195—99 47 Claims

1. A method of stabilizing a labile organic diagnostic reagent compound against hydrolysis in an aqueous solution and which compound contains a cyclic or aromatic group with a phosphate moiety thereon, said method comprising mixing said reagent compound with a stabilizing agent selected from the class consisting of (1) phenol and phenolic compounds, (2) imidazol and (3) nitro aliphatic groups containing from 1 to 6 carbon atoms, said stabilizing agent approximating the effect of the cyclic or aromatic group without the phosphate moiety thereon as a reaction product or portion thereof in a hydrolysis reaction, or the effect of the phosphate moiety which would be produced in a hydrolysis reaction, and which thereby inhibits a hydrolization reaction of said compound, introducing the mixed reagent compound and stabilizing agent into a water containing liquid to form an aqueous solution thereof, and storing said solution.

4,132,599

DETERMINATION OF ANTIMICROBIAL SUSCEPTIBILITIES ON INFECTED URINES WITHOUT ISOLATION

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Grace L. Picciolo, Tantallon, Md.; Emmett W. Chappelle, Baltimore, Md.; Jody W. Deming, Annapolis, Md.; Christian G. Shrock, Eding, Minn.; Hillar Vellend, Toronto, Canada; Michael J. Barza, Boston, and Louis Weinstein, Newtonville, both of Mass.

Filed Apr. 23, 1976, Ser. No. 680,015
Int. Cl.[2] C12K *1/00*
U.S. Cl. 195—103.5 K 21 Claims

1. A method for determining the general susceptibility of bacteria constituting a quantitated infection in a physiological fluid sample to antimicrobial agents without isolation of any individual bacterial strains that may be present by measurement of an ATP index indicating susceptibility, which comprises:

forming a solid containing bacteria by eliminating the liquid phase from the physiological fluid sample;

reconstituting the sample to a liquid by adding an aqueous growth medium to achieve a working inoculum;

pre-incubating the treated sample containing all the bacterial

strains present in the physiological fluid to achieve log growth and dividing the sample into at least three portions;

adding sterile water to two portions and an antibiotic to each remaining portion and assaying one portion of said two portions without antibiotic for ATP;

incubating all other portions for a time sufficient for the antibiotic or antibiotics to take effect against the bacteria present, assuming the antibiotic to be effective;

assaying said all other portions for ATP; and determining the ATP index to indicate sensitivity of the bacteria to the antibiotic according to the formula

$$\text{ATP index} = (B_t - A_0)/(A_t - A_0),$$

where

B_t represents an ATP assay reading for the portion or portions treated with an antibiotic and allowed to incubate;

A_t represents an ATP assay reading for the portion not treated with antibiotic and allowed to incubate; and

A_0 represents an ATP assay reading for the portion not treated with antibiotic and not allowed to incubate.

4,132,600

ENZYMATIC NONINVASIVE METHOD FOR DETECTING CANCER

George M. Plotkin, Lynn, and George Wolf, Lexington, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jun. 1, 1977, Ser. No. 802,227
Int. Cl.[2] G01N *31/14*
U.S. Cl. 195—103.5 R **8 Claims**

1. A method for detecting cancer in mammalian tissue comprising assaying exfoliated cells from said tissue for a significantly altered level of galactosyl transferase activitiy.

4,132,601

POLYMERIZATION INHIBITOR FOR VINYL AROMATIC COMPOUNDS

James M. Watson, Big Spring, Tex., assignor to Cosden Technology, Inc., Big Spring, Tex.

Filed Nov. 23, 1977, Ser. No. 854,409
Int. Cl.[2] B01D *3/34*
U.S. Cl. 203—9 **10 Claims**

1. A process for the distillation of a readily polymerizable vinyl aromatic compound, which comprises subjecting such compound to distillation conditions in the presence of an effective amount of a polymerization inhibitor selected from the group consisting of 3-nitro-2,5-cresotic acid and 3-nitro-2,5-cresotaldehyde.

4,132,602

POLYMERIZATION INHIBITOR FOR VINYL AROMATIC COMPOUNDS

James M. Watson, Big Spring, Tex., assignor to Cosden Technology, Inc., Big Spring, Tex.

Filed Nov. 23, 1977, Ser. No. 854,410
Int. Cl.[2] B01D *3/34*
U.S. Cl. 203—9 **11 Claims**

1. A process for the distillation of a readily polymerizable vinyl aromatic compound, which comprises subjecting such compound to distillation conditions in the presence of an effective amount of a 2-halo-6-nitro-p-cresol as a polymerization inhibitor.

4,132,603

POLYMERIZATION INHIBITOR FOR VINYL AROMATIC COMPOUNDS

James M. Watson, Big Spring, Tex., assignor to Cosden Technology, Inc., Big Spring, Tex.

Filed Nov. 23, 1977, Ser. No. 854,408
Int. Cl.[2] B01D *3/34*
U.S. Cl. 203—9 **11 Claims**

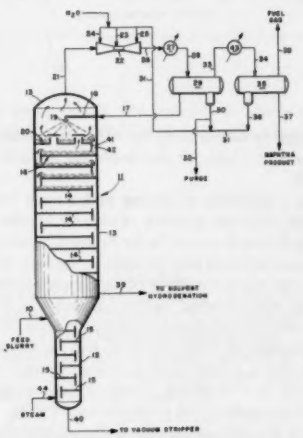
1. A process for the distillation of a readily polymerizable vinyl aromatic compound, which comprises subjecting such compound to distillation conditions in the presence of an effective amount of a 4-halo-3,5-dinitrotoluene as a polymerization inhibitor.

4,132,604

REFLUX RETURN SYSTEM

Dennis G. Alexion, Sarnia, Canada, and Fredrick P. Storm, Jr., Morris Plains, N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Aug. 20, 1976, Ser. No. 715,970
Int. Cl.[2] B01D *3/26, 7/00*
U.S. Cl. 203—87 **4 Claims**



1. A method for avoiding the desublimation of a compound to form solids in a fractionating tower by increasing the temperature of a reflux stream to a value greater than the desublimation temperature of said compound after said reflux stream enters said fractionating tower and before it passes on to a reflux return tray comprising:

(a) passing said reflux stream through an atomizer located above said reflux return tray in said fractionating tower to form a downfalling spray of liquid droplets;

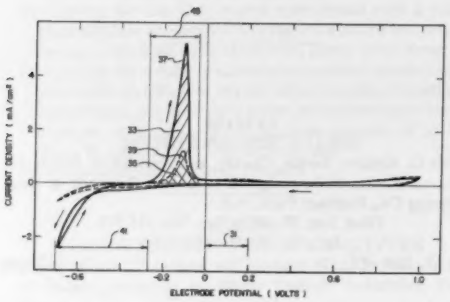
(b) collecing said downfalling droplets as heated reflux on a chimney tray located between said reflux return tray and said atomizer, said chimney tray containing chimneys that convey hot vapors rising from said reflux return tray upward through said chimney tray and wherein said chimney tray is located a sufficient distance below said atomizer to allow sufficient heat transfer from said hot vapors to said downfalling droplets so that the temperature of the heated reflux collected on said chimney tray is greater than the desublimation temperature of said compound; and

(c) passing said heated reflux from said chimney tray onto said reflux return tray.

4,132,605
METHOD FOR EVALUATING THE QUALITY OF ELECTROPLATING BATHS

Dennis M. Tench, and Cameron A. Ogden, both of Thousand Oaks, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 27, 1976, Ser. No. 754,476
Int. Cl.[2] G01N *27/46*
U.S. Cl. 204—1 T 9 Claims



1. A method of determining the effective quantity of organic leveling agent in a bath for electroplating a metal, comprising the steps of:

obtaining a plurality of plating baths, each bath having a different effective quantity of organic leveling agent;

sweeping for each of said baths an inert, working electrode at a predetermined rate through a plurality of voltammetric cycles until a condition of steady state is obtained, each of said voltammetric cycles including a metal plating range and a metal stripping range for each of said baths of said plurality of baths, each of said voltammetric cycles comprising a sweeping of a voltage toward one polarity followed by a sweeping of said voltage toward a reverse of said one polarity to complete said cycle;

measuring the coulombs utilized during said metal strpping range of said cycle for each of said baths of said plurality of baths, whereby a correlation is obtained between the effective quantity of organic leveling agent and said coulombs utilized during said metal stripping range;

obtaining a bath having an unknown quantity of organic leveling agent;

sweeping for said unknown bath an inert, working electrode at said predetermined rate through a plurality of voltammetric cycles until a condition of steady state is obtained, each of said voltammetric cycles including a metal plating range and a metal stripping range for said bath having an unknown quantity of organic leveling agent, each of said voltammetric cycles comprising a sweeping of a voltage toward one polarity followed by a sweeping of said voltage toward a reverse of said one polarity to complete said cycle;

measuring the coulombs utilized during said metal stripping range of said cycle for said bath having an unknown quantity of leveling agent; and

choosing from said correlation a quantity of organic leveling agent which corresponds to said coulombs utilized for said bath having an unknown quantity of organic leveling agent.

4,132,606
PROCESS FOR THE MANUFACTURE OF ELECTRODES

Guy Crespy; Pierre Matthey, both of Geneva, Switzerland, and Manfred A. Gutjahr, Wendlingen, Germany, assignors to Daimler-Benz Aktiengesellschaft Stuttgart-Untertuerkheim, Stuttgart, Germany

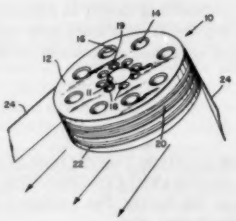
Filed Nov. 28, 1977, Ser. No. 855,337
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1976, 2653984
Int. Cl.[2] C25D *9/04, 9/08*
U.S. Cl. 204—2.1 30 Claims

1. A process for the manufacture of electrodes suitable for electrolytic cells which comprises impregnating a porous matrix structure consisting of an electrode metal with an oxide or hydroxide of the metal by galvanic activation in a bath containing a salt of the metal, in neutral to acid solution, in which at least two porous metal matrix electrodes are placed into the bath and both are impregnated at the same time by applying one terminal of a direct voltage to each electrode and reversing the polarity of the direct voltage at a pulsating frequency, the reversal of polarity taking place at intervals ranging from 4 seconds up to 3 minutes and the metal necessary for impregnation of the electrodes is supplied substantially by the electrode metal.

4,132,607
PROCESS FOR FORMING A CAPSTAN

Alan Painter, Los Angeles; Daniel R. O'Neill, Santa Monica, and George L. Glaeser, Jr., Culver City, all of Calif., assignors to Telex Computer Products, Inc., Tulsa, Okla.

Division of Ser. No. 644,886, Dec. 29, 1975, Pat. No. 4,065,044. This application Jun. 27, 1977, Ser. No. 810,690
Int. Cl.[2] C25D *1/02, 7/04*
U.S. Cl. 204—9 3 Claims



1. A process for forming a capstan which is a monolithic member having a pair of disc-shaped sidewalls and a cylinder-shaped sidewall coupling the periperhies of said disc-shaped sidewalls so that they are parallel to each other, said process comprising the steps of:

a. forming a platen of a dissolvable material, said platen having a pair of disc-shaped sidewalls and a cylindrically shaped sidewall and also having a plurality of holes for forming a plurality of cylindrical posts;

b. electroplating said platen with a platen material; and

c. dissolving said platen in a dissolving solution thereby leaving said capstan.

4,132,608
TECHNIQUE FOR ELECTRODEPOSITION OF WATER-BASED POLYMERIC COATING

Edwin A. Chandross, Berkeley Heights, and Donald J. Freed, Westfield, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

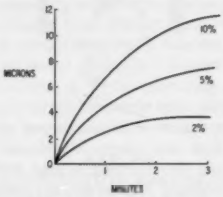
Filed Mar. 9, 1977, Ser. No. 775,770
Int. Cl.[2] C25D *10/00, 5/02, 11/00*
U.S. Cl. 204—27 6 Claims

1. Method for the electrodeposition of a water based polymeric coating having a thickness ranging from 2 to 12 microns

upon wire, cable and the conductive portion of printed circuit boards which comprises the steps of:

(a) providing an electrolytic cell containing an electrolyte comprising an aqueous 2–20 percent alkaline solution of a novolak resin having a molarity ranging from 0.1 to 0.5, said resin being selected from the group consisting of phenol formaldehyde copolymers, cresol formaldehyde copolymers and mixtures thereof, the molecular weight of the resin ranging from 1,500–6,000,

(b) immersing cathode and anode members in the electrolyte, the anode member providing the conductive substrate to be coated,



(c) impressing a difference of potential across the anode and cathode such that the initial current density ranges from 10–30 milliamperes per square centimeter thereby resulting in electrolytic deposition of a polymeric coating on the anode,

(d) cross linking the said coating with a cross linking agent, and

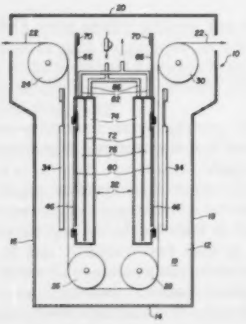
(e) baking the resultant cross linked coating at a temperature ranging from 150°–250° C for a time period ranging from 2–5 minutes.

4,132,609

METHOD OF AND APPARATUS FOR ELECTROLYTIC TREATMENT OF METAL

Glenn W. Bush, Coraopolis, Pa., and Lowell W. Austin, Weirton, W. Va., assignors to National Steel Corporation, Pittsburgh, Pa.

Filed Aug. 8, 1977, Ser. No. 822,672
Int. Cl.² C25D *7/06, 7/10*
U.S. Cl. 204—28 **26 Claims**



1. In a system for electrolytic treatment of an elongated metal member in which the member is drawn through a first electrolyte solution in a container between opposed surfaces of a positively-charged anode and a negatively-charged cathode submerged in the first electrolyte solution, the method comprising the steps of

enclosing the cathode within a fluid-tight chamber submerged within the first electrolyte solution, the chamber having one wall defined by an ion-permeable membrane extending between the metal member and the cathode and in closely spaced generally parallel relation to the cathode surface, and

flowing a second electrolyte solution through the chamber so that at least a portion of the solution flows between the membrane and the adjacent cathode surface to cool the membrane and cathode and remove gas evolved on the surface of the cathode.

4,132,610

METHOD OF BRIGHT ELECTROPLATING OF TIN-LEAD ALLOY

Nobuyasu Dohi, Kobe, and Keigo Obata, Himeji, both of Japan, assignors to Hyogo Prefectural Government, Kobe, Japan

Filed May 18, 1976, Ser. No. 687,582
The portion of the term of this patent subsequent to Jan. 2, 1995, has been disclaimed.
Int. Cl.² C25D *3/60*
U.S. Cl. 204—43 S **1 Claim**

1. a method of bright electroplating of tin-lead alloy which is characterized by using a plating solution containing hydroxyalkyl sulfonic acid and its divalent tin salts and lead salts, represented by the general formula,

$$C_nH_{2n+1}-\underset{\underset{OH}{|}}{CH}-CmH_2m-SO_3H \text{ (n: 0 - 2, m: 1 - 3),}$$

said solution being mixed with reaction products of acetaldehyde with O-toluidine as additives for brightening.

4,132,611

ADDITION OF ORGANIC ELECTROPHILES TO CARBON ACIDS VIA CATALYSIS BY ELECTROGENERATED BASES

Manuel M. Baizer; Richard D. Goodin, both of St. Louis, and Richard C. Hallcher, Maryland Heights, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed May 9, 1977, Ser. No. 794,775
The portion of the term of this patent subsequent to Feb. 7, 1995, has been disclaimed.
Int. Cl.² C25B *3/00, 3/10*
U.S. Cl. 204—59 R **38 Claims**

1. A process for the addition of organic electrophiles to carbon acids via catalysis by electrogenerated bases, which process comprises:

(a) electro-reducing a probase at the cathode by electrolysis in an anhydrous aprotic liquid electrolysis medium comprising the probase, the carbon acid, the organic electrophile, an anhydrous aprotic solvent, and supporting electrolyte to produce the electrogenerated base;

(b) deprotenating the carbon acid with the electrogenerated base to produce a carbon acid anion and the conjugate acid of the electrogenerated base; and

(c) reacting the carbon acid anion with the organic electrophile to yield a carbon acid-organic electrophile addition product;

with the aforesaid probase being more easily electro-reducible than the carbon acid and producing an electrogenerated base strong enough to deprotonate the carbon acid which is strong enough to permit such deprotonation, and the electrogenerated base not reacting readily, unless rapidly reversibly, with the organic electrophile.

4,132,612

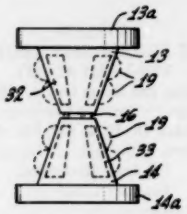
GLOW DISCHARGE METHOD AND APPARATUS

Alan S. Penfold, Playa del Rey, and John A. Thornton, Los Angeles, both of Calif., assignors to Telic Corporation, Santa Monica, Calif.

Division of Ser. No. 535,429, Dec. 23, 1974, Pat. No. 4,041,353, which is a continuation of Ser. No. 254,504, May 18, 1972, abandoned, and a continuation-in-part of Ser. No. 178,240, Sep. 7, 1971, Pat. No. 3,884,793. This application May 31, 1977, Ser. No. 802,059

Int. Cl.[2] C23C *15/00*

U.S. Cl. 204—192 R **51 Claims**



17. A method of sputtering material from a pair of target electrodes onto a substrate, comprising the steps of:

disposing said electrodes within a low pressure working gas environment;

forming a magnetic field which defines, together with said electrodes, a plurality of separate traps with each electrode to contain substantially all electrons emitted from said electrodes and having sufficient energy to create additional ions; and

applying an r.f. voltage across said target electrodes.

32. In an r.f. glow discharge system, the combination comprising:

a pair of shaped electrodes, said electrodes being appropriately shaped and located to complement a magnetic field in providing electron trap boundaries; and

means for forming a magnetic field which defines, in cooperation with said shaped electrodes, a plurality of separate traps with each electrode for containing substantially all electrons emitted from said electrodes and having sufficient energy to create additional ions.

4,132,613

GLOW DISCHARGE METHOD AND APPARATUS

Alan S. Penfold, Playa del Rey, and John A. Thornton, Los Angeles, both of Calif., assignors to Telic Corporation, Santa Monica, Calif.

Division of Ser. No. 535,429, Dec. 23, 1974, Pat. No. 4,041,353, which is a continuation of Ser. No. 254,504, May 18, 1972, abandoned, and a continuation-in-part of Ser. No. 178,240, Sep. 7, 1971, Pat. No. 3,884,793. This application May 31, 1977, Ser. No. 801,765

Int. Cl.[2] C23C *15/00*

U.S. Cl. 204—192 R **51 Claims**

17. A method of sputtering material from a pair of target electrodes onto a substrate, comprising the steps of:

disposing said electrodes within a low pressure working gas environment;

forming a magnetic field which defines, together with said electrodes, simultaneously at least one trap with each electrode while also forming a trap with both of said electrodes in concert, for containing substantially all electrons emitted from said electrodes and having sufficient energy to create additional ions; and

applying an r.f. voltage across said target electrodes.

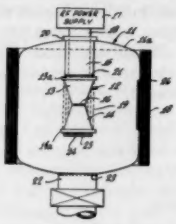
42. Glow discharge apparatus, comprising:

a paid of shaped electrodes, said electrodes being appropriately shaped and located to complement a magnetic field in providing electron trap boundaries;

mounting means for supporting said electrodes in close, spaced apart relationship in a low pressure working gas environment;

power supply means for supplying an electrical voltage across said pair of electrodes; and

magnetic field means for forming a magnetic field which



defines in cooperation with said shaped electrodes, simultaneously at least one completely closed trap with each electrode while also forming a trap with both of said electrodes in concert, for containing substantially all electrons emitted from said electrodes and having sufficient energy to further ionize said working gas.

4,132,614

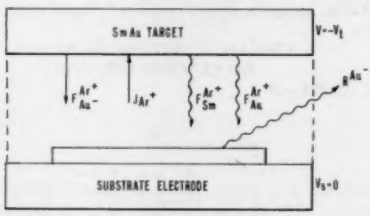
ETCHING BY SPUTTERING FROM AN INTERMETALLIC TARGET TO FORM NEGATIVE METALLIC IONS WHICH PRODUCE ETCHING OF A JUXTAPOSED SUBSTRATE

Jerome J. Cuomo, Lincolndale; Richard J. Gambino, and James M. E. Harper, both of Yorktown Heights, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 26, 1977, Ser. No. 844,541

Int. Cl.[2] C23C *15/00*

U.S. Cl. 204—192 EC **29 Claims**



1. Apparatus comprising an evacuable vacuum chamber including a target and a source of energetic particles for bombarding said target,

wherein said target constitutes a negative-metallic-ion-source material which comprises a source of negative ions of a metal B included in an intermetallic composition including at least two metals A and B, metal B being adapted when in combination with metal A to be ionized to a substantial degree to form quantities of negative ions of metal B upon bombardment by energetic particles of atomic dimensions wherein metal A has an electronegativity X_A and metal B has an electronegativity X_B such that $X_B - X_A$ is greater than about 2.55 electron Volts, with the exception of combinations of metals having a values of Q less than about 0.314, where Q is the fractional ionicity of said intermetallic composition.

15. A method of etching a substrate located across from a target electrode in a partially evacuated sputtering chamber wherein a sputtering gas is employed to bombard said target electrode characterized in that said electrode composed of an intermetallic composition of an A metal and a B metal is being

bombarded with energetic particles of atomic dimensions and the target voltage V_t exceeds the etching threshold voltage V_o, metal A has an electronegativity X_A and metal B has an electronegativity X_B such that $X_B - X_A$ is greater than about 2.55 electron Volts, with the exception of combinations of metals having a value of Q of less than about 0.314, and a quantity of the B atoms leaving said target electrode and negative ions and said ions possess sufficient energy to produce an effective amount of etching, where Q is the fractional ionicity of said intermetallic composition.

29. A method of thin film procesing including the steps of negative ion etching a substrate housed in an evacuated vacuum chamber containing a sputtering gas by means of negative metallic ions generated from a target electrode of intermetallic composition at a voltage V_t greater than the etching threshold voltage V_o of said target electrode followed by lowering said voltage V_t below voltage V_o for sputtering and depositing of material from said target electrode onto said substrate.

4,132,615

INTERNAL COMBUSTION ENGINE EXHAUST GAS OXYGEN SENSOR AND CATALYZER COMBINATION

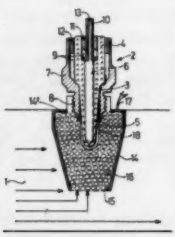
Ernst Linder, Mühlacker; Leo Steinke, Hegnach, and Franz Rieger, Wasseralfingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Continuation of Ser. No. 555,870, Mar. 6, 1975, abandoned. This application Dec. 6, 1976, Ser. No. 747,480

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1975, 2416629

Int. Cl.² G01N 27/46

U.S. Cl. 204—195 S **21 Claims**



1. Internal combustion engine exhaust gas sensor and gas catalyzer combination unit to provide an electrical output signal indicative of the presence of oxygen in the exhaust gases being conducted through a duct means (1) from an internal combustion engine comprising

an oxygen sensing element including

an ion conductive solid electrolyte body (3) shaped to form a tube, open at one end, the closed end of the tube being adapted to be exposed to the exhaust gases from the internal combustion engine,

a first electrode (5) applied to the outside surface of the tube, and

a second electrode (6) applied to the inside of the tube, the sensing signal indicative of presence or absence of oxygen in the exhaust gas being measured across said electrodes (5,6);

and a protective and catalyst unit to catalyze the gas equilibrium of gas to which the sensing unit is exposed and to protect the outside of both the body (3) and the first electrode (5) thereon, including a spacing tube (18) of mesh material surrounding the ion conductive solid electrolyte body (3), with clearance;

a surrounding outer essentially tubular holding element (14, 15) extending into the exhaust gas stream and located to surround the spacing tube (18) and the ion conductive solid electrolyte tube (3) and leaving a space between the spacing tube and the outer holding element to form a chamber;

a catalyst means (16) comprising a carrier coated at least in part with a layer of catalytic material located in said chamber;

and means providing for flow of a sampling gas portion through said chamber comprising at least two openings (15, 17) formed in said outer holding element (14) and located to induce flow of exhaust gases therethrough,

whereby the catalyst will be spaced from the surface of said electrolyte body and will be upstream thereof, with respect to the flow direction of the sampling portion of the stream of exhaust gases through the duct means (1) to which the sensor and gas catalyzer combination is adapted to be exposed.

4,132,616

GAS SENSOR

Anthony D. S. Tantram, Great Bookham; Michael J. Kent, Leighton Buzzard, and Alan G. Palmer, Teddington, all of England, assignors to City Technology Limited, London, England

Filed Mar. 8, 1977, Ser. No. 775,559

Claims priority, application United Kingdom, Mar. 11, 1976, 9843/76

Int. Cl.² G01N 27/46

U.S. Cl. 204—195 P **12 Claims**

2. In an electro-chemical sensor for the measurement of concentrations of gas or vapour in accordance with the limiting current principle, said sensor comprising an electrolytic cell having a sensing electrode, a counter electrode and an intervening body of electrolyte and also including means restricting the rate of access of gas or vapour to said sensing electrode, the improvement wherein said restricting means comprises a porous body in series with capillary passage means, the porous body and the capillary passage means cooperating to provide a gas-phase diffusion barrier defining at least one narrow passage for the diffusion of the gas being sensed so that the gas being sensed remains in the gas phase throughout the process of transport from the gas-mixture under test to the sensing electrode.

4,132,617
APPARATUS FOR CONTINUOUS APPLICATION OF STRIP-, RIBBON- OR PATCH-SHAPED COATINGS TO A METAL TAPE

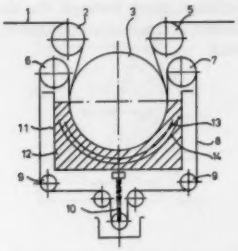
Francis X. Noz, Triesen, Switzerland, assignor to Galentan, A.G., Zug, Switzerland

Division of Ser. No. 512,399, Oct. 4, 1974, abandoned. This application Mar. 28, 1977, Ser. No. 781,825

Claims priority, application Switzerland, Oct. 4, 1973, 14211/73

Int. Cl.[2] **C25D** *17/00*

U.S. Cl. 204—206 **9 Claims**



1. An apparatus for continuously electroplating a longitudinally moving elongated strip with a conductive surface, comprising:

a frame;

a wheel mounted on said frame for rotation about a horizontal axis and having a circumferential face;

guide means for guiding said moving strip into engagement with said face over a predetermined portion thereof and in the direction of rotation of said wheel;

a masking strip continuously guided over said elongated strip for selectively masking areas on said elongated strip which are not to be electroplated;

a tank; said tank adapted to contain an electrolyte at a predetermined level, said tank being positioned relative to said wheel and framework whereby the lower portion of said wheel is immersed in said electrolyte;

a tubular member in said tank opposite the circumferential face of said wheel with respect to the portion of said wheel immersed in said electrolyte;

spray openings in said tubular member and directed toward said face;

means for supplying electrolyte under pressure to said tubular member; and

an anode arranged in said tank independently of said tubular member.

4,132,618
ELECTROLYTIC DEVICE FOR MARKING METALLIC PARTS

Gilbert Boulanger, Aix en Provence, and Georges Duret, Manosque, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 10, 1976, Ser. No. 749,652

Claims priority, application France, Dec. 16, 1975, 75 38530

Int. Cl.[2] **C25D** *17/00, 17/14*

U.S. Cl. 204—218 **7 Claims**

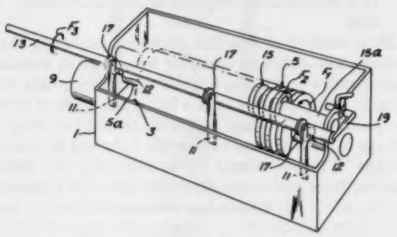
1. An apparatus for electrolytically marking a metallic tube comprising,

a tank adapted to contain an electrolyte,

a cylinder member including a core of electrical insulating material and rollers mounted on said core, each of said rollers including a rim surface portion adapted to be charged with electrolyte, and a metallic part recessed from said rim surface but in contact with electrolyte when retained on said surface,

said cylinder member being disposed at least partially within the tank along a horizontal axis and adapted to be driven in rotation about said axis, said cylinder member further being adapted so that said rollers are partially immersed in electrolyte when contained in the tank and charged with electrolyte upon rotation of the cylinder member,

means adapted to bring the metallic tube to be marked in contact with the electrolyte retained on said rollers when said rollers are charged with electrolyte, and means to maintain said tube free in rotation about its axis,



means adapted to drive said cylinder member and said tube in rotation,

contact means to connect an electric current generator to said metallic tube and to the metallic part of each of said rollers, and

means adapted to selectively supply current to the metallic part of each of said rollers.

4,132,619
ELECTROCATALYST

Yitzchak Klein, and Jonathan R. Goldstein, both of Jerusalem, Israel, assignors to State of Israel, Ministry of Industry, Commerce and Tourism, National Physical Laboratory of Israel and The Scientific Research Foundation, both of Jerusalem, Israel

Filed Aug. 2, 1977, Ser. No. 822,369

Claims priority, application Israel, Aug. 6, 1976, 50217

Int. Cl.[2] **B01J** *23/74;* **H01M** *4/58, 8/00;* **C25B 11/06**

U.S. Cl. 204—242 **17 Claims**

1. Crystalline mixed oxide selected from compounds of the formulae $Co_xFe_{3-x}O_n$ and $Co_xNi_{3-x}O_n$, wherein x is between 0.05 and 3, n is between 3 and 5, containing from about 0.05 to 20 atom percent boron calculated on the mixed oxide.

16. Electrical secondary cells, fuel cells or electrolysis cells comprising an electrocatalytically active borided mixed oxide claimed in claim 1 in the form of an electrode or auxiliary electrode.

4,132,620
ELECTROCATALYTIC ELECTRODES

Antonio Nidola, and Placido M. Spaziante, both of Lugano, Switzerland, assignors to Diamond Shamrock Technologies S.A., Geneva, Switzerland

Filed Feb. 2, 1978, Ser. No. 874,863

Int. Cl.[2] **C25B** *11/04;* **H01M** *4/86;* **C01G** *17/00;* **B32B** *31/06*

U.S. Cl. 204—242 **12 Claims**

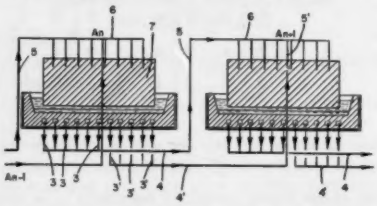
1. An electrode for electrochemical reactions, comprising a corrosion resistant substrate having a coating which contains an electrocatalytically effective amount of germanium disulfide.

12. An electrolysis cell comprising at least one anode and cathode and means for impressing an electrolysis current, wherein the anode comprises a corrosion resistant electrically conductive substrate having a coating which contains an electrocatalytically effective amount of germanium disulfide.

4,132,621
METHOD OF IMPROVING THE CURRENT SUPPLY OF ELECTROLYSIS CELLS ALIGNED IN A LENGTHWISE DIRECTION

Paul Morel, Le Vesinet; Jean-Pierre Dugois, Ste. Jean de-Maurinne, and Bernard Langon, Lannemezan, all of France, assignors to Aluminum Pechiney, Lyon, France

Filed Jan. 12, 1978, Ser. No. 868,861
Claims priority, application France, Jan. 19, 1977, 77 02213
Int. Cl.[2] C25C *3/16*
U.S. Cl. 204—243 M **3 Claims**

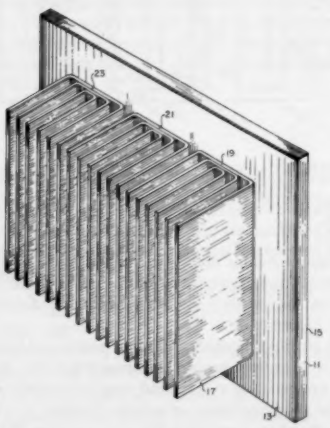


1. A method of improving the current supply of electrolysis cells aligned in a lengthwise direction in order to reduce the interferences caused by the induced magnetic field, comprising dividing the cathode output bars on each side of the cells into at least two separate groups containing a substantially equal number of bars, and supplying the beam of the cell in row n with current both via the upstream head from the upstream group of cathode bars of the cell in row $n-1$ and via at least one side riser on each side connected to at least one intermediate point in the beam situated between the upstream head and the downstream head from the downstream group of cathode bars of the cell in row $n-1$.

4,132,622
BIPOLAR ELECTRODE

Edward J. Kenney, Amherst, N.Y., assignor to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Filed Nov. 30, 1977, Ser. No. 856,074
Int. Cl.[2] C25B *11/02, 11/10, 9/00*
U.S. Cl. 204—268 **8 Claims**

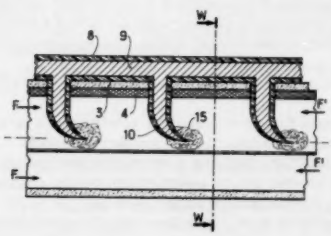


1. A bipolar electrode comprising an anode member and a cathode member, each of said members formed of a non-foraminous metal, each of said members having a base structure and a plurality of blades removeably attached to the active face thereof, said blades positioned to intermesh with each other upon assembly in a cell, said anode and cathode members being joined together in an electrically conductive unit, at least one of said members having a concave portion which when the members are joined together forms a hollowed section in the interior of said electrode, and, at least one gas vent between the interior of said hollow section and the exterior of said electrode, said vent or vents effecting the release of gases from the interior of said hollow section.

4,132,623
DEVICE FOR REGENERATING ZINC

Jean Jacquelin, Limours, France, assignor to Compagnie Generale d'Electricite, Paris, France

Filed Dec. 5, 1977, Ser. No. 857,832
Claims priority, application France, Dec. 3, 1976, 76 36512
Int. Cl.[2] C25C *7/00, 7/08*
U.S. Cl. 204—275 **7 Claims**



1. A device for regenerating zinc from an alkaline zincate solution which is in contact with at least two electrodes connected to a D. C. generator so that the zinc particles are deposited on the negative electrode and the oxygen is evolved at the positive electrode, and wherein said method comprises alternating period steps including a deposition step in which the solution is conveyed past the negative electrode in a first direction at a speed which is sufficiently low for the zinc particles to be deposited thereon, and detachment step in which the solution is conveyed past the negative electrode in the opposite direction at a speed which is sufficiently high for the previously-deposited zinc particles to be detached from the negative electrode, said device comprising:

a tubular pipe for conveying of said alkaline zincate solution for the regeneration of the zinc,

said negative electrode being disposed substantially on the axis of said tubular pipe,

said tubular pipe being made of an impervious insulative material,

said positive electrode being disposed in the form of a layer on the inner surface of said tubular pipe, said positive electrode being made of a porous conductive material including nickel for effecting the evolution of oxygen thereat,

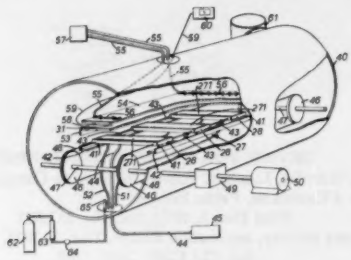
said negative electrode being formed by metal protrusions whose ends are disposed substantially on the axis of said tubular pipe, said protrusions being connected to a base disposed on the outside of and in contact with said tubular pipe and being partially covered with an insulative layer, and said base being totally covered with said insulative layer.

4,132,624

APPARATUS FOR PRODUCING METAL OXIDE FILMS

Robert D. King, Solihull, and Robert Hiscutt, Birmingham, both of England, assignors to Triplex Safety Glass Company Limited, London, England

Continuation of Ser. No. 472,325, May 22, 1974, abandoned, which is a division of Ser. No. 220,899, Jan. 26, 1972, Pat. No. 4,006,070. This application Apr. 6, 1977, Ser. No. 785,106
Claims priority, application United Kingdom, Feb. 5, 1971, 4234/71
Int. Cl.[2] C23C *15/00*
U.S. Cl. 204—298 24 Claims



1. Apparatus for depositing a transparent, electrically conducting, metal oxide film onto the surface of a substrate whose lateral dimensions exceed 30 cm., said apparatus comprising:

(a) a vacuum chamber;

(b) means for supporting the substrate in the vacuum chamber;

(c) means for maintaining the substrate at a controlled elevated temperature in the vacuum chamber;

(d) means for supplying a sputtering atmosphere of oxygen and another gas or gases at a controlled reduced pressure into the vacuum chamber;

(e) a cathode assembly whose overall lateral dimensions are not substantially less than those of the substrate, said cathode assembly being arranged in the vacuum chamber in the vicinity of the substrate and presenting a plurality of elongated, side-by-side strips comprising a metal capable of being reactively sputtered, said strips being spaced apart to define passages therebetween for allowing the sputtering atmosphere to penetrate into the whole of the working space between the cathode assembly and the substrate;

(f) means for applying a high negative potential to the cathode assembly so as to cause deposition of the metal oxide film on the substrate by reactive sputtering; and

(g) means for causing relative translational movement between the cathode assembly and the substrate in a direction transverse to the length of said strips, through an amplitude substantially smaller than the overall length of the cathode assembly, but sufficient to cause all parts of the substrate to be coated by sputtering from at least one of said strips during the deposition process.

4,132,625

SEWAGE OSMOSIS SYSTEM

Earl C. Peterson, and Frank P. Coolbroth, both of Minneapolis, Minn., assignors to Sewage Osmosis Inc., Minneapolis, Minn.

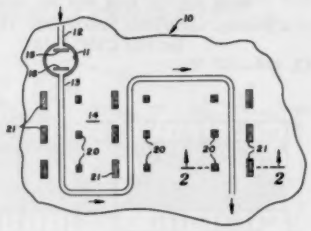
Filed Mar. 16, 1978, Ser. No. 887,335
Int. Cl.[2] B01D *13/02*; C02C *5/12*
U.S. Cl. 204—299 R 7 Claims

1. Means for dispersing aqueous effluents from a sewage treatment system consisting of a generally closed septic tank and an adjacent disposal field, the arrangement comprising:

(a) a generally closed septic tank vessel arranged to receive raw sewage and to retain solids therein and discharge aqueous fluid effluent therefrom;

(b) a disposal field disposed adjacent said septic tank vessel and arranged to receive aqueous effluent from said septic tank vessel;

(c) anode means and cathode means arranged generally laterally of said disposal field with said anodes and cathodes being disposed on opposed sides of said disposal field; and



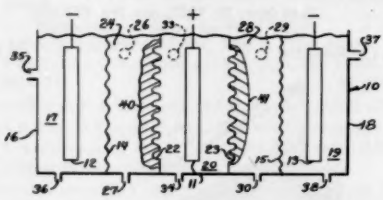
(d) said anode means consisting essentially of at least one discrete cell of a crushed raw rock mineral selected from the group consisting of dolomite, hard limestone, and basalt, together with approximately 1% to about 67% of fused dolomite based on the rock mineral, and with said cathode means consisting essentially of at least one discrete cell of high carbon coke.

4,132,626

ELECTROFLOCCULATION CELL

Albert C. Kunkle, Macon, Ga., assignor to J. M. Huber Corporation, Borger, Tex.

Division of Ser. No. 689,632, May 24, 1976, Pat. No. 4,048,038, which is a continuation-in-part of Ser. No. 486,941, Jul. 8, 1974, abandoned. This application Apr. 22, 1977, Ser. No. 789,871
Int. Cl.[2] B01D *13/02*
U.S. Cl. 204—301 13 Claims



1. An electroflocculation cell for separating clay solids from aqueous suspensions thereof comprising

an anode,

a cathode,

a first semi-permeable membrane impermeable to solid particles positioned between the anode and cathode, the space between the cathode and the membrane defining a cathodic chamber,

a second semi-permeable membrane positioned between the said first semi-permeable membrane and the anode, the space between the said second semi-permeable membrane and the anode defining an anodic chamber,

a slurry chamber comprising the area between the said first and second semi-permeable membranes,

inlet means to feed an aqueous suspensions of clay particles to the said slurry chamber into the space between the said first and second membranes,

outlet means to discharge solid particle depleted effluent from the said slurry chamber,

means to add an electrolyte solution having a pH in the range of 2–7 to the cathodic chamber,

means to add an electrolyte solution to the anodic chamber, and

means for applying a direct current field between the anode and cathode.

4,132,627

INTEGRATED COAL CONVERSION PROCESS

Arnold M. Leas, 309 E. Van Buren, Columbia City, Ind. 46725

Filed Dec. 6, 1977, Ser. No. 858,045
Int. Cl.[2] C10G *1/08*
U.S. Cl. 208—10 7 Claims

1. A method of converting coal to liquid and gaseous fuels which comprises:

(a) hydrocracking a coal and oil mixture in a coal reactor in the presence of hydrogen produced in the manner hereinafter specified in step (d) and also in the presence of a particulate mixture of sand, clay or mixtures thereof and a first iron and chromium alloy, thereby forming a spent particulate mixture of sand, clay or a mixture thereof having a carboncoating thereon and a first spent iron and chromium alloy, coal ash and an overhead product comprising cracked oil vapors and fuel gases;

(b) withdrawing the spent particulate mixture of carbon-coated sand, clay or mixtures thereof and said first spent iron and chromium alloy from said coal reactor and removing the carbon coating from said sand, clay or mixtures thereof in the presence of an oxygen-containing gas to form carbon monoxide and a regenerated particulate mixture of sand, clay or mixtures thereof and a first regenerated iron and chromium alloy;

(c) passing said carbon monoxide into a bed comprising a particulate oxidized second iron and chromium alloy and reducing said particulate oxidized second alloy to metallic form;

(d) passing steam into the bed of metallic alloy obtained in step (c) to form hydrogen;

(e) passing at least a portion of the hydrogen produced in step (d) into the coal reactor of step (a) as hydrogen for effecting hydrocracking therein; and,

(f) passing said regenerated particulate mixture of said sand, clay or mixture thereof and first iron and chromium alloy from step (b) into the coal reactor of step (a) as the mixture of sand and first iron and chromium alloy therein.

4,132,628

METHOD FOR RECOVERING HYDROCARBONS FROM MOLTEN METAL HALIDES

Melvyn B. Pell, Bethel Park, Pa., assignor to Continental Oil Company, Stamford, Conn. and The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 12, 1977, Ser. No. 824,181
Int. Cl.[2] C10G *13/08;* C01G *9/04*
U.S. Cl. 208—108 5 Claims

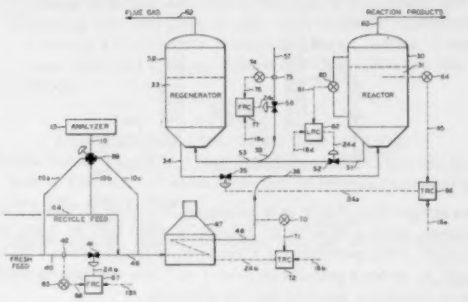
1. In a process for hydrocracking heavy carbonaceous materials by contacting said heavy carbonaceous materials with hydrogen in the presence of a molten metal halide catalyst to produce hydrocarbons having a lower molecular weight and thereafter separating at least a major portion of said hydrocarbons from the spent molten metal halide, the improvement comprising separating a major portion of said hydrocarbons from said spent melt and thereafter injecting into said spent molten metal halide a liquid low-boiling hydrocarbon stream so that said liquid low-boiling hydrocarbon stream is vaporized in said spent molten metal halide thereby recovering additional quantities of heavy hydrocarbonaceous material from said spent molten metal halide.

4,132,629

HYDROCARBON CRACKING

Raymond D. McCoy, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 15, 1974, Ser. No. 514,933
Int. Cl.[2] C10G *11/18*
U.S. Cl. 208—113 14 Claims



1. A method for cracking a hydrocarbon feedstock, said method comprising:

passing said feedstock to a cracking zone;

generating a first signal representative of the ratio of heavy aromatics to total aromatics within said feedstock;

controlling the reaction conditions within said cracking zone in response to said first signal; and

removing the cracked hydrocarbon products from said cracking zone.

4,132,630

METHOD FOR SEPARATING SOLIDS FROM COAL LIQUIDS

Norman L. Carr, Allison Park, and Edgar L. McGinnis, Gibsonia, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Apr. 3, 1978, Ser. No. 893,084
Int. Cl.[2] C10G *29/06*
U.S. Cl. 208—177 18 Claims

1. In a process for separating particles of coal minerals from a coal liquid in which they are suspended, the improvement comprising adding a mixture of a calcium salt and hydrocarbonaceous oil to said coal liquid prior to the separation step, the addition of said mixture increasing the rate of separation of the coal mineral particles from the coal liquid.

4,132,631

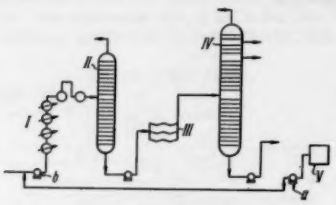
PROCESS FOR PETROLEUM REFINING

Nikolai S. Nametkin, Leninsky prospekt, 13, kv. 11, Moscow; Mikhail S. Matveev, ulitsa Shkolnaya, 3, kv. 12, Kstovo Gorkovskoi oblasti; Sergei P. Gubin, ulitsa Ostrovityanova, 21, kv. 114, Moscow; Abram S. Dekhterman, ulitsa Shkolnaya, 7, kv. 3, Kstovo Gorkovskoi oblasti; Vladimir D. Tjurin, Leninsky prospekt, 67, kv. 33, Moscow; Anatoly P. Skibenko, ulitsa Shkolnaya, 5, kv. 20, Kstovo Gorkovskoi oblasti; Valentina S. Orlova, ulitsa Mira, 25a, kv. 4, Kstovo Gorkovskoi oblasti; Alevtina I. Savenko, ulitsa 40 let Oktyabrya, 17a, kv. 52, Kstovo Gorkovskoi oblasti, and Irina P. Podolskaya, Lomonosovsky prospekt, 7, korpus 1, kv. 39, Moscow, all of U.S.S.R.

Continuation of Ser. No. 577,466, May 14, 1975, abandoned.
This application Jan. 27, 1977, Ser. No. 763,039
Claims priority, application U.S.S.R., May 17, 1974, 2023702
Int. Cl.[2] C10G *29/04, 7/00*
U.S. Cl. 208—236 3 Claims

1. A process for petroleum refining to obtain petroleum products having a reduced content of sulphur, oxygen, and nitrogen-containing compounds which comprises introducing into the petroleum being distilled a non-volatile carbonyl com-

pound of the formula $ML_nM_q(CO)_m$, where M is a transition metal selected from the group consisting of Ni, Co, Mn and Fe; L is an amine selected from the group consisting of ammonia, pyridine, piperidine, morpholine, γ-picoline, ethylene diamine, monoethanolamine, diethanolamine and triethanolamine; n is



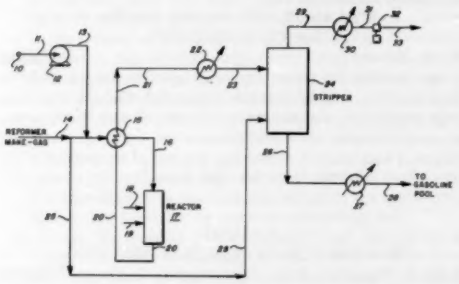
an integer from 2 to 6; m is an integer from 3 to 13; and q is an integer from 1 to 4; in an amount of from 0.02 to 0.2% by weight of the petroleum at a temperature ranging from 150° to 350° C. under a pressure of from 1 to 7 atm absolute to distill said petroleum into said desired products.

4,132,632

SELECTIVE HYDRODESULFURIZATION OF CRACKED NAPHTHA

Albert P. Yu, Taipei, Taiwan, and Edward C. Myers, Glen Ellyn, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Mar. 31, 1978, Ser. No. 892,389
Int. Cl.² C10G *23/02*
U.S. Cl. 208—216 **8 Claims**



1. A process for the selective desulfurization of cracked naphthas, which process comprises contacting a cracked naphtha comprising paraffins, naphthenes, aromatics, and unsaturates in a reaction zone under hydrodesulfurization conditions and in the presence of hydrogen with a catalyst to furnish a product containing unsaturates and a reduced amount of sulfur, said catalyst comprising a hydrogenation component which comprises a Group VIB metal and a Group VIII metal deposed on a solid support comprising at least 70 wt. % magnesium oxide, said Group VIB metal and said Group VIII metal being present as a member selected from the group consisting of (1)) the elements, (2) their oxides, (3) their sulfides, and (4) mixtures thereof wherein said Group VIB metal of said catalyst is present in an amount of about 4 wt. % to about 6 wt. % and said Group VIII metal of said catalyst is present in an amount of about 0.5 wt. % to about 2 wt. % each amount being based on the total weight of the catalyst and being calculated as the oxide of the respective metal.

4,132,633

METHOD FOR SEPARATING MIXTURE OF PLASTICS

Kozo Saitoh, Tokyo, and Sumio Izumi, Sayama, both of Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Muromachi, Japan

Filed Mar. 14, 1975, Ser. No. 558,606
Claims priority, application Japan, Mar. 14, 1974, 49-29335; Mar. 14, 1974, 49-29336
Int. Cl.² B03B *1/00*
U.S. Cl. 209—9 **18 Claims**

1. A method for separating polyethylene and/or polypropylene from a mixture of plastics consisting of a polystyrene and at least one of polyethylene and polypropylene, which comprises dispersing a mixture of said plastics in an aqueous liquid medium along with at least one wetting agent in an amount sufficient and continuing the dispersing for a time sufficient to make the surface of the polystyrene more hydrophilic than that of the polypropylene and/or polyethylene; discontinuing the dispersing while introducing gas bubbles into the mixture, whereby the gas bubbles selectively adhere to the surface of the polypropylene and/or polyethylene and float the polypropylene and/or polyethylene; and recovering the polyethylene and/or polypropylene as a float and leaving the polystyrene as a residue.

10. A method of separating polypropylene from a mixture of plastics consisting of polypropylene and a polystyrene, which comprises dispersing a mixture of said plastics in an aqueous medium along with at least one wetting agent in an amount sufficient and continuing the dispersing for a time sufficient to make the surface of the polystyrene more hydrophilic than that of the polypropylene; discontinuing the dispersing while introducing gas bubbles into the mixture, whereby the gas bubbles selectively adhere to the surface of the polypropylene and float the polypropylene, and recovering the polypropylene as a float and leaving the polystyrene as a residue.

13. A method of separating polyethylene from a mixture of plastics consisting of polyethylene and a polystyrene, which comprises dispersing a mixture of said plastics in an aqueous medium along with at least one wetting agent in an amount sufficient and continuing the dispersing for a time sufficient to make the surface of the polystyrene more hydrophilic than that of the polyethylene; discontinuing the dispersing while introducing gas bubbles into the mixture, whereby the gas bubbles selectively adhere to the surface of the polyethylene and float the polyethylene; and recovering the polyethylene as a float and leaving the polystyrene as a residue.

16. A method of separating polypropylene from a mixture of plastics consisting of polypropylene and polyethylene, which comprises dispersing a mixture of said plastics in an aqueous medium along with at least one wetting agent in an amount sufficient and continuing the dispersing for a time sufficient to make the surface of the polyethylene more hydrophilic than that of the polypropylene; discontinuing the dispersing while introducing gas bubbles into the mixture, whereby the gas bubbles selectively adhere to the surface of the polypropylene and float the polypropylene; and recovering the polypropylene as a float and leaving the polyethylene as a residue.

4,132,634

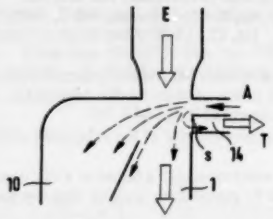
METHOD OF AN APPARATUS FOR SIFTING PARTICULATE MATERIAL IN A CROSS-CURRENT

Hans Rumpf, Hansjakobstr. 12, 75 Karlsruhe, and Kurt Leschonski, Clausthal-Zellerfeld, both of Fed. Rep. of Germany, assignors to Hans Rumpf, Karlsruhe, Fed. Rep. of Germany

Continuation of Ser. No. 613,490, Sep. 15, 1975, abandoned. This application Jun. 28, 1977, Ser. No. 810,749
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1974, 2444378
Int. Cl.² B07B *4/00*
U.S. Cl. 209—136 **21 Claims**

1. In apparatus for sifting particulate material in a cross-current comprising:

(a) a flow duct for material charged sifting gas having an inlet opening and a material charging opening essentially perpendicular thereto;
(b) means supplying a sifting gas current at high velocity to said inlet opening;
(c) means for propelling material to be separated to a charging point at said charging opening in said duct and into said sifting zone, said means arranged to propel said material transversely with respect to the sifting gas current;
(d) at least one knife edge pointed so as to oppose the trajectory of the material propelled into said sifting zone;



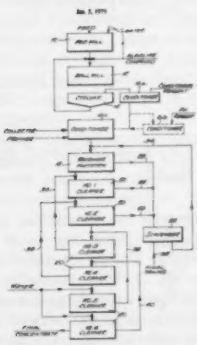
(e) a coarse material collecting receptacle on the side of said knife edge opposite the material charging point; and
(f) a discharge duct on the other side of said knife edge, wherein the improvement comprises:
(g) an additional discharge duct having an inlet opening into said sifting zone duct down stream of the material charging point and immediately therebehind for drawing a partial current of the entering sifting gas therethrough, said duct extending primarily in a direction opposite said material input direction such as to have its current component with a direction opposite the material input direction.

4,132,635

BENEFICIATION OF IRON ORES BY FROTH FLOTATION

David C. Yang, Houghton, Mich., assignor to Michigan Technological University, Houghton, Mich.

Filed Jan. 13, 1977, Ser. No. 759,094
Int. Cl.[2] B03D *1/02*
U.S. Cl. 209—166 **12 Claims**



1. A method of beneficiating siliceous oxidized iron ores by froth flotation of iron oxide from silica-containing gangue including the steps of

forming an aqueous pulp of the ore having a particle size suitable for froth flotation;

conditioning the pulp by adding thereto a pre-mixed conditioning reagent formed by mixing a water-soluble polyvalent metal salt with an aqueous solution of an alkali metal silicate, in an amount sufficient to provide from about 0.05 to about 4 pounds of alkali metal silicate per ton of ore, calculated as SiO_2 equivalent, and to provide from about 0.02 to about 2 pounds of polyvalent metal salt per ton of ore, and by adding thereto an effective amount of an anionic collector selective to flotation of iron oxide; and

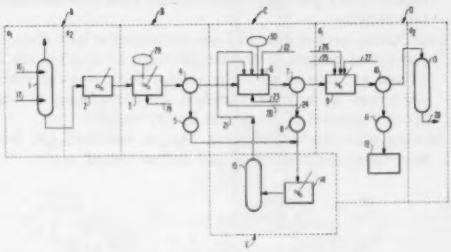
subjecting the conditioned pulp to a flotation operation whereby a concentrate containing a major portion of the iron oxide and a tailing relatively rich in silica are produced.

4,132,636

METHOD FOR TREATING GAS LIQUOR

Toshio Iwase, Kasukabe; Teruo Hashimoto, and Youko Iguchi, both of Tokyo, all of Japan, assignors to Niigata Engineering Co., Ltd., Tokyo, Japan

Filed Nov. 28, 1977, Ser. No. 855,504
Claims priority, application Japan, Aug. 24, 1977, 52-101415
Int. Cl.[2] C02C *1/04, 5/04*
U.S. Cl. 210—6 **16 Claims**



1. A method for treating a gas liquor discharged from the quenching of a coke oven gas, the gas liquor containing ammonia, phenols, thiocyanate compounds, cyanide compounds, suspended solids and oils, which comprises the steps of

(A) reducing the ammonia content of the gas liquor to about 1,000 ppm or less;
(B) subjecting the gas liquor from step (A) to a first biological treatment comprising treating the gas liquor treated in step (A) with microorganisms;
(C) subjecting the gas liquor treated in step (B) to a second biological treatment comprising treating the gas liquor treated in step (B) in an aeration tank including a mixture of suspended solids comprising powdered activated carbon and activated sludge mixed with the gas liquor; and
(D) adding an iron salt to the gas liquor from step (C) to cause a coagulation and a sedimentation.

4,132,637

OZONE DISINFECTION IN WASTE WATER TREATMENT WITH RECYCLING OF OZONATION OFF GAS

William P. Key, Lakewood; David C. Ihrig, Littleton, and Darrell W. Monroe, Lakewood, all of Colo., assignors to FMC Corporation, Chicago, Ill.

Filed Sep. 2, 1976, Ser. No. 719,835
Int. Cl.[2] C02C *1/06;* **C02B** *1/38*
U.S. Cl. 210—7 **26 Claims**

1. A method of treating by the activated sludge method aqueous waste material that has a BOD_5 of from about 60 parts per million to about 300 parts per million, and contains pathogenic agents such as bacteria and viruses in an amount creating an ozone disinfection demand in the effluent from the oxygen treatment facility of the activated sludge sewage treatment plant of at least about 4 parts per million, and further oxygenat-

ing and disinfecting said effluent with oxygen and ozone, which comprises:

introducing said aqueous waste material into an oxygen treatment facility which includes at least one zone in which an oxygen enriched gas is introduced into the aqueous material being treated and at least one settling and clarifying zone;

introducing an oxygen enriched gas through a gas feed conduit into said aqueous waste material in said first mentioned zone, said gas containing at least about 70 percent of oxygen by dry weight;

flowing the contents of said first mentioned zone to said settling and clarifying zone and holding the same there to cause activated sludge to settle out while liquid effluent flows from said settling and clarifying zone;

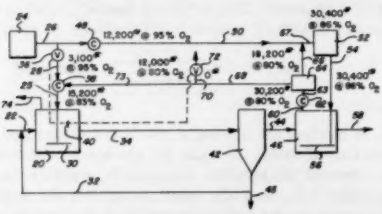
returning at least a portion of said settled activated sludge to said first mentioned zone into which said oxygen enriched gas is introduced;

thoroughly mixing said aqueous waste material, said oxygen enriched gas, and said return activated sludge in said first mentioned zone to produce mixed liquor containing suspended biomass and inert solid particles;

introducing the liquid effluent from said oxygen treatment facility into a gas-tight ozone contact zone downstream of said facility;

introducing oxygen enriched gas containing at least about 90 percent of oxygen of dry weight from an original source of said gas into an ozone generator the output of which comprises an oxygen enriched gas containing at least about 1 percent of ozone gas by dry weight;

flowing said ozone-containing oxygen enriched gas from said ozone generator into said ozone contact zone;



thoroughly mixing said ozone-containing oxygen enriched gas with the liquid contents of said ozone contact zone to inactivate said pathogenic agents and produce substantially disinfected water for removal as plant effluent from the outlet of said contact zone;

flowing said substantially disinfected water from the outlet of said contact zone;

flowing from said ozone contact zone the excess oxygen enriched gas depleted at least partially of ozone and oxygen;

removing substantially all the mositure vapor and entrained moisture from at least about 30 percent by dry weight of said excess oxygen enriched gas to dry said portion of gas while leaving the nitrogen and carbon dioxide contained in said gas;

mixing oxygen enriched gas delivered from said original source as make-up gas with dried excess nitrogen- and carbon dioxide-containing oxygen enriched gas, derived as aforesaid from said ozone contact zone, as a recycle component, said recycle component constituting between about 30 percent and about 90 percent by weight of the excess oxygen enriched gas that flows from said ozone contact zone, to introduce said recycle component into said ozone generator together with said make-up gas when the latter is introduced into the generator as aforesaid;

diverting at least a portion of the remainder of said excess oxygen enriched gas from said ozone contact zone to said gas feed conduit of said oxygen treatment facility;

introducing at least a portion of said gas thus diverted into the aqueous material contained in said oxygen treatment facitity; and

venting to the atmosphere excess oxygen that remains undissolved in the aqueous material contained in said oxygen treatment facility.

4,132,638

AEROBIC, THERMOPHILIC DEGRADATION WITH ENZYME ADDITION

Carl-Göran H. Carlsson, Tomelilla, Sweden, assignor to PLM AB, Sweden

Filed Jul. 7, 1977, Ser. No. 813,742
Claims priority, application Sweden, Jul. 7, 1976, 7607763
Int. Cl.[2] C02C *1/06, 5/10*
U.S. Cl. 210—7 **19 Claims**

1. A process for aerobic substantially thermophilic degradation in the liquid phase of microbially degradable substances comprising the sequential steps of:

(a) reducing the particle size of the substance to a maximum of 50 mm;

(b) mixing the substance with a liquid to a dry content of not greater than 15 percent by weight, thereby producing a slurry;

(c) controlling the pH of the slurry to a maximum of 12;

(d) adding enzyme in a sufficient amount to promote degradation;

(e) preheating the slurry to a temperature of 40–80° C at a time not prior to the introduction of said enzyme;

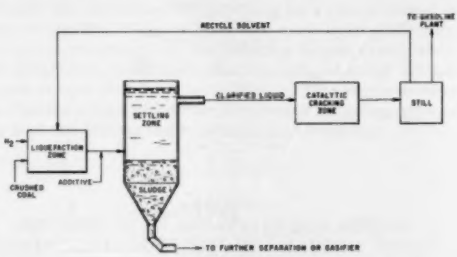
(f) subjecting the slurry to a continuous, aerobic, substantially thermophilic degradation treatment by action of aerobic, thermophilic and/or facultative micro-organisms in the presence of air for a period not greater than 10 days while maintaining the slurry temperature between 40 and 80° C; and utilizing at least a portion of the active sludge so formed for inoculating untreated slurry and dewatering the remaining slurry.

4,132,639

METHOD FOR IMPROVING THE SEDIMENTATION AND FILTERABILITY OF COAL-DERIVED LIQUIDS

Sidney Katz, Oak Ridge, and Billy R. Rodgers, Concord, both of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 717,430, Aug. 24, 1976, abandoned. This application Aug. 4, 1977, Ser. No. 821,665
Int. Cl.[2] B01D *21/01*
U.S. Cl. 210—51 **10 Claims**



1. In a process for separating suspended solids from the carbonaceous liquid product resulting from the liquefaction of coals, lignites, oil shale, and tar sands in which solids size is a separation parameter, said suspended solids including ash and insoluble organic matter, the improvement comprising maintaining said carbonaceous liquid product containing solids at 150°–400° C to increase the effective particle size of said solids as a function of time while contacting said carbonaceous liquid product containing solids with an additive consisting essen-

tially of material selected from the group of P_2O_5, H_2SO_4, H_3PO_4, and salts of sulfuric and phosphoric acid, for a time sufficient to enhance the rate of increase of said effective particle size said additive present in a concentration of about 0.01–3.0 wt.% with respect to said carbonaceous liquid containing solids, and separating said suspended solids from said carbonaceous liquid product at said temperature.

4,132,640

PROCESS FOR THE HYGIENIC ELIMINATION OF SEWAGE CONTAINING SALT-CONTAINING ORGANIC SUBSTANCES

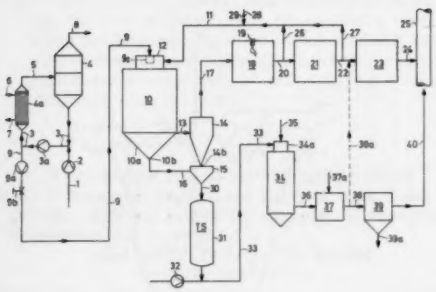
Ernst Filzmoser, Dubendorf, Switzerland, assignor to Von Roll AG, Gerlafingen, Switzerland

Filed May 11, 1977, Ser. No. 795,890

Claims priority, application Switzerland, May 17, 1976, 6144/76

Int. Cl.[2] C02B 3/04

U.S. Cl. 210—68 **13 Claims**



1. A process for the hygienic elimination of sewage which includes salt-containing organic substances, said process comprising the steps of:

concentrating the sewage by evaporation;

atomizing the concentrated sewage to a finely dispersed form;

combining the atomized concentrated sewage with hot gases at a temperature of about 600° C. in a dryer, thereby substantially completely removing the residual water content thereof by evaporation;

separating the thus obtained dry substance of the atomized, concentrated and evaporated sewage from the residual aqueous drying vapors said steps of combining the atomized concentrated sewage and separating said sewage from the residual aqueous drying vapors resulting in readily volatile organic substances being released with said drying vapors;

burning the readily volatile organic substances in the residual aqueous drying vapors; from said burning step as said hot gases in said combining step for evaporation of the atomized, concentrated sewage;

feeding said dry substances into a hot combustion chamber by means of an oxygen-containing carrier gas;

heating the dry substance in said combustion chamber to a temperature of about 1100° C. so rapidly that the salt content of the sewage is converted substantially instantaneously from its solid aggregate state in said dry substance into the gaseous phase and therefore substantially without salt fusion;

oxidizing the organic substances in the sewage by heating in said hot combustion chamber;

removing the hot flue gases formed during combustion of the organic substances in the hot combustion chamber together with the salts in the gas phase from said hot combustion chamber;

cooling the hot flue gases and gaseous salts contained therein from said hot combustion chamber to a temperature of about 200° C. in such a rapid manner so that said gaseous salts are converted back into the solid aggregate state; and separating the salts from the flue gases, and discharging said gases into the atmosphere.

4,132,641

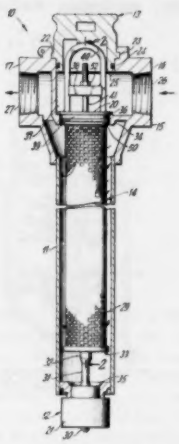
FILTER ASSEMBLY AND METHOD OF FILTERING

Robert M. Elsworth, Loudonville, N.Y., assignor to General Electric Company, Waterford, N.Y.

Continuation-in-part of Ser. No. 591,691, Jun. 30, 1975, abandoned. This application Mar. 2, 1977, Ser. No. 773,698

Int. Cl.[2] B01D 37/00

U.S. Cl. 210—73 R **18 Claims**



1. A method for filtering high viscosity fluids which comprises the steps of:

(a) causing a high viscosity fluid to flow under high pressure, and

(b) directing the high viscosity fluid under high pressure to an elongated housing having at the upper portion thereof an inlet aperture for receiving all the high viscosity fluid under high pressure, said inlet and outlet apertures being located on an axis perpendicular to the elongated axis of said housing, and a replaceable filter basket assembly mounted within said housing including a perforated tube, a handle assembly, a base mounted to the respective ends of the tube, and a substantially cylindrical filter screen positioned within the tube, said base forming a continuous closure for said basket assembly and said filter screen comprising a rolled, slidably overlapping, fine mesh screen, further directing fluid flow for filtering from the inlet aperture into the center of the basket assembly, through the screen and surrounding perforated tube, and then through the outlet aperture, and producing a high pressure drop across the filter screen.

2. A filter assembly for filtering high viscosity fluids comprising:

(a) means causing a high viscosity fluid to flow under high pressure, and

(b) an elongated housing having at the upper portion thereof an inlet aperture receiving all said high viscosity fluid under high pressure and an outlet aperture discharging said high viscosity fluid, said inlet and outlet apertures being located on an axis perpendicular to the elongated axis of said housing, and a replaceable filter basket assembly mounted within said housing including a perforated tube, a handle assembly, a base mounted to the respective ends of the tube, and a substantially cylindrical filter screen positioned within the tube, said base forming a continuous closure for said basket assembly and said filter screen comprising a rolled, slidably overlapping, fine

mesh screen, wherein the direction of fluid flow for filtering is from the inlet aperture into the center of the basket assembly, through the screen and surrounding perforated tube, and then through the outlet aperture and wherein there is a high pressure drop across the filter screen.

4,132,642

PROCESS FOR FILTERING A CELLULOSE ACETATE SOLUTION

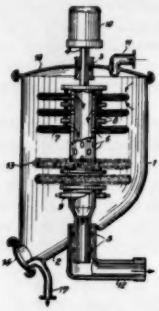
Hans Müller, Erlenbach; Rudolf Bühler, Wolfhausen, and Nikolas Rapsomanikis, Mannedorf, all of Switzerland, assignors to Chemap AG, Mannedorf, Switzerland

Filed Sep. 6, 1977, Ser. No. 830,444

Claims priority, application Switzerland, Sep. 7, 1976, 11354/76

Int. Cl.[2] B01D *37/02*

U.S. Cl. 210—75 **9 Claims**



1. A process for filtering a cellulose acetate solution comprising the steps of providing a solution of cellulose acetate in an organic solvent; adding to said solution a mixture of quartz sand in loose particulate form and a loose fiber material; and filtering said mixture through a filter so as to produce a filtrate of said solution, whereby due to the addition of said loose particulate quartz sand and of said loose fibers clogging of the pores of the filter is reduced relative to the amount of filtrate passing through the filter and the effective filtering time of the filter is thereby increased.

4,132,643

SLUDGE AND SLIME SEPARATING AND SETTLING DEVICE

Ake O. V. Hellqvist, 130 40 Djurhamn, Sweden

Continuation of Ser. No. 709,131, Jul. 27, 1976, abandoned. This application Jan. 25, 1978, Ser. No. 872,149

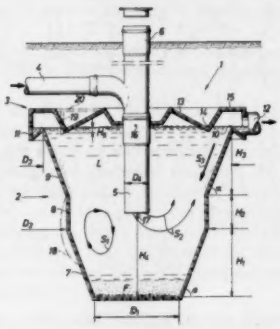
Claims priority, application Sweden, Jul. 29, 1975, 7508608

Int. Cl.[2] C02C *1/26*

U.S. Cl. 210—84 **14 Claims**

1. A domestic waste water and sewage sludge separating and settling device which comprises a container of essentially circular cross section over the main part of the vertical extension of the container, said container comprising a bottom wall, a lower, essentially frusto-conical, upwardly diverging part extending a distance H_1 upwardly from said bottom wall and having a diameter D_1 at its lower end, and essentially cylindrical intermediate part extending a distance H_2 upwardly from said lower part and having a diameter D_2 and an upper, esssentially frusto-conical, upwardly diverging part extending a distance H_3 upwardly from said intermediate part and having a diameter D_3 at its upper end, the ratios of the distances H_1, H_2 and H_3 being $H_1 : H_2 : H_3 = 1$ to 2 : 0.5 to 1.5 : 1 to 2, and the ratios of the diameters D_1, D_2 and D_3 being $D_1 : D_2 : D_3 = 0.3$ to 0.8 : 1 : 1.2 to 1.5, the upper end of the container being provided with a spillover overflow extending around the major part of its periphery, and the device also comprising means defining a vertically directed liquid inlet opening arranged essentially in the middle of a horizontal cross section through the device and at a vertical distance H_4 from said bottom wall which is from $\frac{1}{3}$ to $\angle$ of the sum of the distances H_1, H_2 and H_3, said inlet opening directing the flow of water towards the bottom of the device, a cover which encloses the upper end of said container and an annular weir extending from above the overflow level to below said level, the vertical projection of said weir falling within the limits of the vertical projection of the upper conical part of the container.

14. A method of purifying a flow of domestic waste water, comprising passing said flow into a chamber of essentially circular horizontal cross section over the main part of the vertical extension of the chamber, said chamber being bounded by a bottom wall, a lower, essentially frusto-conical, upwardly diverging part extending a distance H_1 upwardly from said bottom wall and having a diameter D_1 at its lower end, an essentially cylindrical intermediate part extending a distance H_2 upwardly from said lower part and having a diameter D_2 and an upper, esentially frusto-conical, upwardly diverging



part extending a distance H_3 upwardly from said intermediate part and having a diameter D_3 at its upper end, the ratios of the distances H_1, H_2 and H_3 being $H_1:H_2:H_3 = 1$ to 2; 0.5 to 1.5:1 to 2, the ratios of the diameter D_1, D_2 and D_3 being $D_1:D_2:D_3 = 0.3$ to 0.8:1:1.2 to 1.5, the slope angle of the wall of at least one of said lower and upper conical parts amounting to from 50° to 80°, said flow being passed vertically downwards into said chamber through a liquid inlet opening arranged essentially in the middle of a horizontal cross section of the chamber at a vertical distance H_4 from the bottom wall of the chamber where H_4 is from $\frac{1}{3}$ to $\frac{2}{3}$ of the sum of the distances H_1, H_2 and H_3, and further comprising allowing liquid to leave the chamber by way only of the upper eno of the upper part of the chamber, and causing liquid in the central region of the horizontal cross section of the chamber at the level of the upper end of the upper part of the chamber to flow downwardly, beneath an annular weir which projects downwards into the chamber to a height between $H_1 + H_2$ and $H_1 + H_2 + H_3$ from the bottom wall of the chamber, in order to leave the chamber.

4,132,644

MEANS FOR REGULATING AND MONITORING DIALYSIS OF BLOOD IN A DIALYZER

Ole-Robert Kolberg, Heggedal, Norway, assignor to A/S Nycotron, Drammen, Norway

Filed Jun. 28, 1977, Ser. No. 810,726

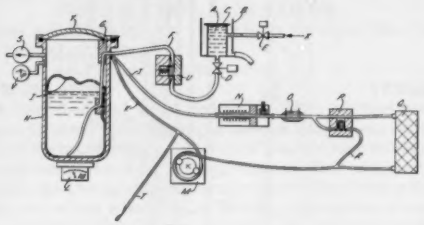
Int. Cl.[2] B01D *31/00*

U.S. Cl. 210—85 **4 Claims**

1. Means for regulating and monitoring the dialysis of blood in a dialyzer included in a recirculation circuit for dialyzing liquid, said circuit further comprising:

(a) a liquid reservoir constituted by a flexible liquid tight bag;

(b) conduits tightly sealed to said liquid tight bag for liquid flow in closed circuit between said bag and the dialyzer;
(c) scale means for weighing the liquid contained in said bag, thereby indicating the amount of ultrafiltrate extracted from the dialyzed blood and received by the dialyzing liquid; and



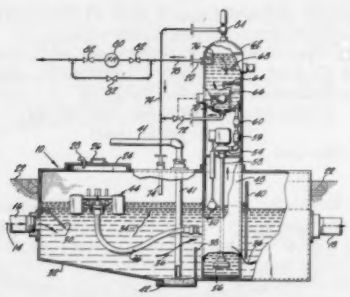
(d) a tightly closable pressure tank enclosing the liquid tight bag, the tank volume outside the bag being connected with a suction pump adapted to provide a suitably reduced pressure in said recirculation circuit, in order to achieving predetermined regulation of said extracted amount of ultrafiltrate from the blood.

4,132,645

TWO-STAGE OIL SKIMMER SEPARATOR

James C. Bottomley, Sapulpa, and Henry G. Nash, Tulsa, both of Okla., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Jul. 15, 1977, Ser. No. 816,109
Int. Cl.[2] B01D *21/10*
U.S. Cl. 210—104 **6 Claims**



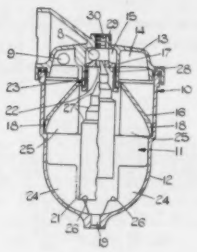
1. A two-stage oil-water separator comprising:
(a) a first stage separator defining a tank structure providing an inlet for the oil-water mixture, an exit for separated water, which provides for gravity separation of the oil water mixture;
(b) a skimmer means floating on liquid in said tank for skimming the oil off of the top of the liquid surface;
(c) baffle means submerged in said tank which retains oil in said tank but allows water to flow out of said tank;
(d) a chamber located within said tank and extending upwardly therefrom receiving in a bottom portion of said chamber by gravity flow said skimmed oil from said skimmer means, said chamber including a pump activated by a float switch to pump accumulated oil to a second stage separator within said chamber for further separation of oil and water, a heater means within said second stage separator for providing further separation of water from the oil skimmed from the top of said first stage; said second stage separator having means for removing oil from the top thereof and means for withdrawing water which has settled to the bottom thereof and returning said water back to the first stage separator.

4,132,646

SEPARATING DEVICE

Peter J. Bartlett, Maidenhead, and Herbert D. B. Taylor, London, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Nov. 18, 1977, Ser. No. 852,914
Claims priority, application United Kingdom, Dec. 10, 1976, 51606/76
Int. Cl.[2] B01D *21/24*
U.S. Cl. 210—114 **8 Claims**



1. A device for substantially separating a first liquid from a second liquid which is contaminated by the first liquid, comprising: a casing defining a chamber and an inner wall, an inlet for conveying to the chamber said second liquid contaminated by said first liquid, an outlet for conveying from the chamber second liquid from which said first liquid has substantially been separated, the separated first liquid being collected in a lower portion of the chamber in use, and a valve for controlling the flow of liquid through the chamber, the valve including a seating and a float adapted to engage the seating and arranged to float on the separated first liquid in the lower portion of the chamber, a plurality of vanes having inner ends and constraining the float to movement towards and away from the seating, said vanes being disposed between the float and said inner wall of the casing and being mounted on the inner wall of the casing, the float being accommodated between the inner ends of the vanes, the inner ends of the vanes being stepped so as to define a stop to limit the extent of movement of the float away from the seating, a substantially frusto-conically shaped element disposed in the chamber, a gap or gaps being defined between the wider end of the element and the inner wall of the casing, a liquid flowing from the inlet to the outlet via the gap or gaps in use, and a further plurality of vanes disposed between the float and the element, said further vanes being mounted on the element and extending inwardly therefrom, the float being accommodated between the inner ends of the further vanes.

4,132,647

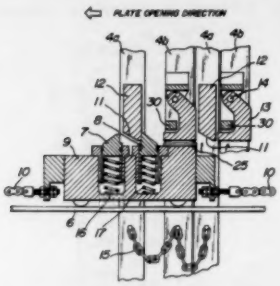
FILTER PLATE OPENING MECHANISM FOR FILTER PRESSES

Hiroshi Sakuma, Nagoya, Japan, assignor to NGK Insulators Ltd., Japan

Filed Sep. 16, 1977, Ser. No. 834,133
Claims priority, application Japan, Jul. 14, 1977, 52-83519
Int. Cl.[2] B01D *35/00*
U.S. Cl. 210—230 **4 Claims**

1. A filter plate opening mechanism for successively opening partial filter plates of a filter press, which filter plates are vertically supported on a filter plate support frame, comprising filter plate pulling latches arranged on side surfaces of every other filter plate, pivotal pendulums arranged on side surfaces of remaining filter plates, plate connectors substantially the same in length connecting all the filter plates, and a pair of

carriages arranged on rails parallel to said filter plate support frame provided on both sides of said filter plates, each carriage being driven by a chain whose ends are connected to said carriage to form an endless linkage therewith and having a pair of ratchets in opposition to each other capable of depressing and restoring with the aid of springs, whereby when said carriage moves in a filter plate opening direction, one of said pair of ratchets engages the filter plate pulling latch of one of the filter plates to shift the filter plate in the opening direction and the movement of the engaged filter plate causes to shift successively in the same direction at least two other filter plates connected thereto by said plate connector, and when



said carriage moves through separated filter plates in a direction opposite to said opening direction, said pair of ratchets are depressed by their abutments against said filter plate pulling latch and said pivotal pendulums are upwardly pivotally moved by abutments of said pair of ratchets thereagaint, thereby enabling said carriage to pass by the separated filter plates in the direction opposite to said opening direction and when said carriage approaches the close filter plates in the direction opposite to said opening direction, the other of said pair of ratchets engages the pivotal pendulum restrained by the adjacent filter plate pulling latch resulting in the stopping of said carriage which thereafter moves in the opening direction.

4,132,648

BUOYANT FLUID SEPARATION DEVICE

Henry F. Miller, San Jose; Abraham Borts, Santa Clara, and Folker H. Weiss, Cupertino, all of Calif., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Mar. 3, 1977, Ser. No. 773,839
Int. Cl.[2] B01D *17/02*
U.S. Cl. 210—242 R **10 Claims**

1. A device for separating fluids of differing physical properties comprising

a group of coaxial, generally vertically disposed, interconnected discs having oleophilic surfaces,

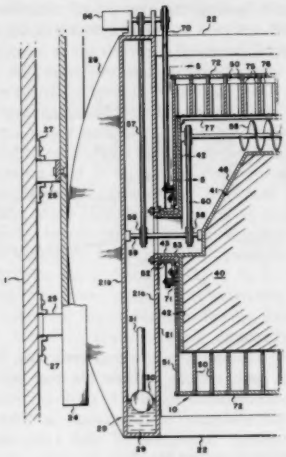
an aperture in each of said discs,

means for rotatably mounting the end discs of said group onto a support,

a closed buoyancy chamber attached to said support, journaled within and extending through the apertures in said discs,

an upwardly facing trough in the upper periphery of said buoyancy chamber,

a plurality of spring biased wiper blades pressed into wiping engagement with the surfaces of said discs, said wipers being mounted on said buoyancy chamber between the top portions of said discs, whereby oil wiped from the surfaces of the discs will fall into said trough, and activating means for providing rotational movement to said discs relative to the liquids to be separated.

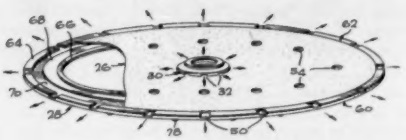


4,132,649

GASKET ARRANGEMENT FOR PURIFICATION APPARATUS

Gerald A. Croopnick, Laguna Hills; John M. Michaels, and Donald G. Paul, both of Irvine, all of Calif., assignors to Dresser Industries, Inc, Dallas, Tex.

Filed Mar. 28, 1977, Ser. No. 781,761
Int. Cl.[2] B01D *31/00*
U.S. Cl. 210—347 **6 Claims**



1. Purification apparatus comprising:

a stack of membrane packs;

a stack of gaskets having radially outer portions surrounding said packs and radially intermediate and inner portions integral with the outer portions, said inner portions disposed between adjacent packs to separate them, each gasket forming an outer land at its outer gasket portion, which extends along most of the periphery of the gasket, and said outer lands of said gaskets bearing on one another, the inner portion of each gasket having a thickness less than the outer portion of the gasket but great enough so that said membrane packs are compressed between the inner portions of adjacent gaskets; and

means for maintaining said stack of gaskets in compression, whereby a high pressure of the gaskets on one another can be established, largely independently of the compression of the membrane packs which is largely determined by the thickness, and therefore spacing, of the inner gasket portions.

4,132,650

FUSED FIBER BLOOD FILTER

Ulrich Kirsch, Melsungen, and Manfred Krull, Heiligkreuzsteinach, both of Fed. Rep. of Germany, assignors to B. Braun Melsungen Aktiengesellschaft, Melsungen and Carl Freudenberg, Kommanditgesellschaft, Weinheim, both of, Fed. Rep. of Germany

Filed Nov. 8, 1974, Ser. No. 522,308

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1973, 2356353

Int. Cl.[2] B01D *25/06*

U.S. Cl. 210—491 8 Claims

1. A filter for blood which comprises a body of fibers noninjurious to blood compacted to a uniform density and thickness, said fibers comprising a mixture of fibers having different softening temperatures including at least one fiber component which has the lowest softening temperature of the fibers in the mixture and which is softened by heating at its softening temperature whereby the fibers in said mixtures are permanently bonded together; and characterized in that an additional layer, consisting only of fibers having said lowest softening temperature, is applied to one face of the filter.

4,132,651

SEPARATING DEVICE TO SEPARATE TWO LIQUIDS OF DIFFERENT SPECIFIC GRAVITY

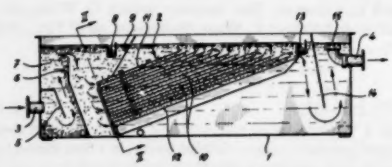
Leendert W. C. deJong, Westkade 27, Hellevoetsluis, Netherlands

Continuation of Ser. No. 769,212, Feb. 16, 1977, abandoned. This application Mar. 13, 1978, Ser. No. 885,871

Claims priority, application Netherlands, Feb. 19, 1976, 7601702

Int. Cl.[2] B01D *17/02, 21/10*

U.S. Cl. 210—522 1 Claim



1. A separating device for separating two liquids of different specific gravities comprising a basin, a separator unit therein having flow ways spaced one above the other formed of imperforate, upwardly inclined inverted V-shaped plates for the flow of the liquid of lighter specific gravity toward the apex of each plate and upwardly in the direction of the length of the plates, the upper end portions of said inverted V-shaped plates being of pointed form, the inlet for the liquids of different specific gravities being adjacent to the lower extremities of the plates and the outlets for the cleaned liquid and for the lighter liquid separated in the separator unit being at the upper extremities of the plates and at the upper extremities of the wall of the basin, and an overflow weir in the basin between the separator unit and the outlet for the cleaned liquid.

4,132,652

SLOTTED BAFFLE FOR USE IN SEPARATING OIL-WATER MIXTURES

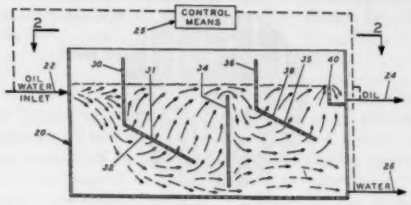
David K. Anderson, Coalinga, and Marvin A. Stewart, Avenal, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Oct. 11, 1977, Ser. No. 841,183

Int. Cl.[2] B01D *17/02*

U.S. Cl. 210—536 4 Claims

1. An improved baffle section for use in an oil-water separation tank comprising a perpendicular solid portion and an inclined slotted portion extending downwardly and inwardly in the direction of flow from the lower edge of said perpendicular portion, said slotted portion having at least 3 rows of downwardly spaced-apart slots, each row extending laterally



across said slotted portion, the uppermost of said rows having an average of from ½ to 2 slots per lateral meter and each of the lower rows therefrom having at least 25% more slots than said uppermost row.

4,132,653

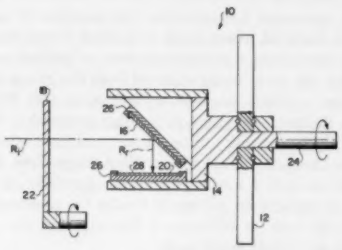
POLARIZATION ANALYZER FOR VACUUM ULTRAVIOLET AND X-RAY RADIATION

James A. R. Samson, 1600 Regency Dr., Lincoln, Nebr. 68520

Filed Jun. 29, 1977, Ser. No. 811,273

Int. Cl.[2] G01N *23/20*

U.S. Cl. 250—272 4 Claims



1. Apparatus for use in determining the degree of polarization of vacuum ultra-violet and x-radiation comprising

a planar mirror,

means for mounting said mirror at an angle of incidence of 45° with respect to radiation,

means for rotatably mounting said mirror mounting means such that said mirror is rotatable about an axis parallel to the optical axis of the radiation,

a detector, and

means for pivotably mounting said detector with respect to said mirror such that said detector is pivotable between a first position wherein said detector detects the radiation incident on said mirror and a second position wherein said detector detects the radiation reflected by said mirror.

4,132,654

X-RAY FOCAL SPOT TEST SYSTEM

Martin Braun, Stamford, Conn., assignor to The Machlett Laboratories, Inc., Stamford, Conn.

Filed Jul. 2, 1976, Ser. No. 702,178

Int. Cl.[2] G03B *5/17*

U.S. Cl. 250—320 10 Claims

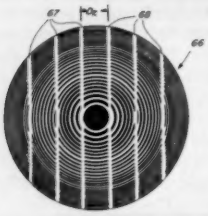
8. A method for evaluating a focal spot area in an X-ray tube and comprising the steps of:

operating the X-ray tube to produce a divergent X-ray beam,

disposing an X-ray image receptor in the path of the beam,

disposing a Fresnel zone plate between the X-ray tube and the image receptor to produce a visible shadow image

having a parallel series of spaced linear resolution losses and associated phase reversals; and



studying the phase reversals to evaluate the energy distribution in the focal spot comprising determining dimensions of the focal spot area from dimensions of the visible shadow image.

4,132,655

FIRE-RETARDANT COMPOSITION AND METHOD OF RENDERING CELLULOSIC MATERIALS FIRE-RETARDANT

Samuel M. Draganov, 17966 Orange Tree La., Tustin, Calif. 92680

Filed Dec. 13, 1977, Ser. No. 860,179
Int. Cl.[2] C09K *3/28*
U.S. Cl. 252—8.1 **10 Claims**

1. An improved fire-retardant composition of matter for cellulosic material, comprising a mixture containing, as the principal ingredient, a reaction product of sulfuric acid and a borate ore, the latter being selected from the group consisting of calcium, sodium, magnesium, and potassium borates and mixtures thereof, said reaction product containing boric acid and a significant quantity of one or more sulfates selected from the group consisting of calcium, sodium,magnesium, and potassium sulfates; and, as a relatively minor ingredient, an effective amount of ammonium sulfate to render the composition substantially at least as effective a fire-retardant for cellulosic materials as is solely boric acid.

4,132,656

SOLID PARTICLES CONTAINING LUBRICATING OIL COMPOSITION AND METHOD FOR USING SAME

Donald L. DeVries, South Holland, and James M. DeJovine, Homewood, both of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 752,225, Dec. 20, 1976, Pat. No. 4,094,799. This application Apr. 3, 1978, Ser. No. 893,100
Int. Cl.[2] C10M *5/02, 7/04, 1/10, 3/02*
U.S. Cl. 252—30 **23 Claims**

1. A composition of matter comprising a major amount by weight of oil of lubricating viscosity; a minor amount by weight of solid particles effective to improve the lubricating properties of said composition; and a minor amount by weight of a nitrogen-containing polymer selected from the group consisting of

(a) graft polymer having grafted onto an olefin polymer backbone a dialkylaminoalkyl methacrylate;

(b) an interpolymer of a long chain n-alkyl-methacrylate and a dialkylaminoalkyl methacrylate or a N(alkanone) acrylamide; and

(c) mixtures thereof;

said nitrogen-containing polymer being present in an amount effective to reduce the deposit forming tendencies of said composition.

3. The composition of claim 2 wherein said solid particles are graphite, molybdenum disulfide, zinc oxide or mixtures thereof, said solid particles being present in the amount of about 0.05% to about 5% by weight of the total composition and said nitrogen-containing polymer is present in an amount of about 0.1% to about 12% by weight of the total composition.

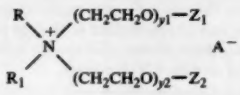
4,132,657

TREATMENT OF METAL SURFACES

Robert J. Verdicchio, Succasunna, N.J., and Louis J. Nehmsmann, III, Ellicott City, Md., assignors to GAF Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 557,043, Mar. 10, 1975, abandoned, which is a continuation of Ser. No. 349,649, Apr. 9, 1973, abandoned. This application Sep. 1, 1976, Ser. No. 719,518
Int. Cl.[2] C10M *1/48;* C07F *9/09*
U.S. Cl. 252—32.5 **7 Claims**

1. A method comprising treating a steel surface with a lubricating composition containing an effective lubricating amount of an amphoteric surface active agent of the formula:



wherein R is C_{6-22}alkyl,

R_1 is C_{1-2}alkyl or benzyl,

y_1 and y_2 are each integers of 1–50,

Z_1 is, with the bonded O atom, a phosphate ester group in free acid form or in the form of its sodium, potassium, calcium or magnesium salt,

Z_2 is H or Z_1, and

A is a halogen, sulfate or C_{1-2}alkyl sulfate anion.

4,132,658

PROCESS FOR MANUFACTURING ALUMINUM COMPLEX SOAP THICKENED GREASE

Richard L. Coleman, Port Arthur; Arnold C. Witte, Jr., Port Neches, and Aubrey L. Stone, Beaumont, all of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Mar. 27, 1978, Ser. No. 890,750
Int. Cl.[2] C10M *1/20, 3/14, 5/12, 7/16*
U.S. Cl. 252—37.7 **6 Claims**

1. In a process for manufacturing aluminum complex soap thickened greases, comprising blending, in a first blending step, a base oil with organic carboxylic acids, suitable as precursors of aluminum complex soap to form a base oil-organic acid mixture, blending, in a second blending step, said base oil-organic acids mixture with an organo-aluminum compounds suitable as a precursor of aluminum complex soap to form a base oil-organic acid-organo-aluminum mixture, reacting, a saponification step, said base oil-organic acid-organo aluminum mixture, at elevated temperature under conditions of high shear mixing to produce a base oil-aluminum complex soap mixture, blending, in a third blending step, said base oil-aluminum complex soap mixture with extreme pressure additives for producing a grease mixture, milling, in a colloid milling step, said grease mixture for increasing the consistency of said grease mixture to a predetermined value, and drawing said hardened grease mixture, as aluminum complex soap thickened grease product into packages or storage; the improvements which comprise:

a. providing, in said second blending step, a molar excess of said organo aluminum over that required for forming aluminum complex soap with said organic carboxyllic acids such that the ratio of carboxylic acid functions to aluminum is in the range of 1/0.5 to 1/1 respectively for improving antiwear properties of said aluminum complex soap thickened grease product;

b. reacting, in said saponification step, said base oil-organic acid-organo aluminum mixture at a temperature in the range of about 365–375° F for a period not exceeding about one hour, for improving water resistance of said aluminum complex soap thickened grease product;

c. milling, in said colloid milling step, a minor portion of said

grease mixture for increasing the consistency of said milled portion;

d. blending, in a fourth blending step, said milled minor portion of said grease mixture with the unmilled major portion of said grease mixture at a temperature of about 140° F or less for producing said aluminum complex soap thickened grease product of desired consistency and having rheopectic properties such that the consistency of the grease product increases under shear conditions; and

e. drawing, in said drawing step, said aluminum complex soap thickened grease product at a temperature of about 140° F or less into packages or storage such that said aluminum complex soap thickened grease is of uniform appearance and essentially free of gelatinous inclusions.

4,132,659

SULFUR AND CHLORINE-CONTAINING LUBRICATING OIL ADDITIVE

Bruce W. Hotten, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 30, 1977, Ser. No. 866,075
Int. Cl.[2] C10M *1/38*
U.S. Cl. 252—48.8 **10 Claims**

1. A process for preparing a lubricating oil additive which comprises heating at 140°–200° C. for 1–20 hours a mixture of a 1-alkene with sulfur and sulfur monochloride in a molar ratio of about 1:0.6–0.9:0.05–0.2 respectively to yield an additive containing 5–20% sulfur and 0.5–5% chlorine.

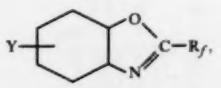
4,132,660

GREASE COMPOSITIONS

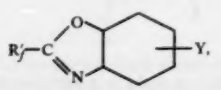
John B. Christian, Yellow Springs, and Christ Tamborski, Dayton, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 1, 1978, Ser. No. 882,527
Int. Cl.[2] C10M *1/32, 3/26, 5/20, 7/30*
U.S. Cl. 252—51.5 R **12 Claims**

1. A grease composition comprising a major amount of a perfluorinated polyalkylether base fluid, a minor amount of a fluorocarbon polymer thickening agent for the base fluid, and a rust and corrosion inhibiting amount of a fluorine-containing benzoxazole having the following structural formula:



wherein R_f is perfluoroalkyl, perfluoroalkylether, or



in which R_f is perfluoroalkylene or perfluoroalkyleneether and Y is perfluoroalkyl, perfluoroalkylether or hydrogen.

4,132,661

LUBRICATING OIL ADDITIVES AND COMPOSITION CONTAINING SAME

James O. Waldbillig, Wappingers Falls, and Carmen M. Cusano, Poughkeepsie, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Sep. 13, 1976, Ser. No. 722,897
Int. Cl.[2] C10M *1/32*
U.S. Cl. 252—51.5 A **4 Claims**

1. A lubricating composition comprising a major portion of a lubricating oil and an effective dispersing and viscosity improving amount of an additive having a thickening power at 210° F in the range of 1.0 to 100 SUS and an infrared spectrum containing absorbance peaks at frequencies in the range of 1550–1750 cm^{-1}. obtained by dissolving in an inert solvent from 10 to 100,000 parts by weight of a ethylene/propylene copolymer or terpolymer of an unsaturated hydrocarbon having a molecular weight of 5000 to 500,000 adding to the resulting solution a free radical iniator catalyst; bubbling air through the reaction medium to hydroperoxidize said copolymer or terpolymer; then adding from 100 to 100,000 parts of said lubricating oil; removing said inert solvent by vacuum distillation; adding 1 to 20 parts by weight of a di(lower)-alkylamino(-lower)alkylamine containing both tertiary and primary amino nitrogen groups; heating the mixture for 0.5 hours to 20 hours at a temperature of 80–250° C under a pressure of 0 to 1000 psig and distilling the reaction mass under vacuum at 80 to 300 degrees C to remove excess polyamine and initiator.

4,132,662

ROLLING OIL FOR ALUMINOUS METALS

Robert J. Sturwold, Cincinnati, Ohio, assignor to Emery Industries, Inc., Cincinnati, Ohio

Filed Jan. 5, 1978, Ser. No. 867,107
Int. Cl.[2] C10M *1/24, 3/18, 5/12;* B21B *45/02*
U.S. Cl. 252—56 R **9 Claims**

1. A rolling oil composition consisting essentially of an aliphatic or aromatic hydrocarbon oil having a 100° F. viscosity of 20 to 100 SUS and 1 to 20 weight percent of a lubricant additive containing:

(a) from about 25% to 65% by weight dimer acid containing greater than 75% by weight C_{36} dibasic acid and having a maximum iodine value of 35;

(b) from about 15% to 45% by weight of a saturated fatty alcohol having 8 to 20 carbon atoms; and

(c) from about 15% to 45% by weight of a lower alkyl ester of a fatty acid having from 12 to 18 carbon atoms.

7. A process for cold rolling and aluminous metal which comprises applying to the surface of said metal an effective lubricating amount of a rolling oil composition consisting essentially of an aliphatic or aromatic hydrocarbon oil having a 100° F. viscosity of 20 to 100 SUS and 1 fo 20 weight percent of a lubricant additive containing:

(a) from about 25% to 65% by weight dimer acid containing greater than 75% by weight C_{36} dibasic acid and having a maximum iodine value of 35;

(b) from about 15% to 45% by weight of a saturated fatty alcohol having 8 to 20 carbon atoms; and

(c) from about 15% to 45% by weight of a lower alkyl ester of a fatty acid having from 12 to 18 carbon atoms.

4,132,663

MINERAL OIL COMPOSITIONS HAVING IMPROVED POUR POINT CONTAINING ALPHA-OLEFIN COPOLYMERS

William J. Heilman, Allison Park, and Thomas J. Lynch, Oakmont, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation of Ser. No. 558,946, Mar. 17, 1975, abandoned, which is a continuation-in-part of Ser. No. 308,312, Nov. 21, 1972, abandoned.

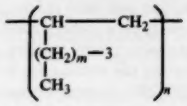
This application Apr. 11, 1977, Ser. No. 786,537

The portion of the term of this patent subsequent to Apr. 19, 1994, has been disclaimed.

Int. Cl.[2] C10M *1/16*

U.S. Cl. 252—59 **7 Claims**

1. An oil composition of lowered pour point comprising a major amount of a mineral lubricating oil or a No. 2 fuel oil and from about 0.025 (M_o/84) weight percent to about 0.4 (M_o/84) weight percent of a linear alpha-olefin copolymer synthesized from 1-hexene and 1-octadecene and having the formula



wherein m is 6 or 18 with between about 60 to about 95 percent of the pendant groups resulting from 1-hexene and the remainder resulting from 1-octadecene, and the average of n is between about 50 and about 5,000; and

where M_0 is the average molecular weight of the 1-hexene and 1-octadecene that is incorporated into said copolymer.

4,132,664

FUNCTIONAL FLUID METHOD USING ALKOXYSILANE MULTIPLE CLUSTER COMPOUNDS

Karl O. Knollmueller, Hamden, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed May 20, 1977, Ser. No. 798,970

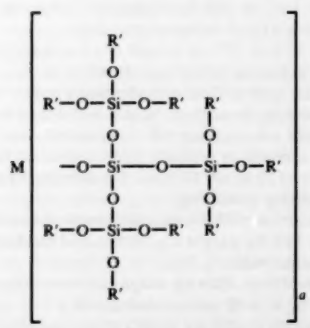
The portion of the term of this patent subsequent to Nov. 16, 1993, has been disclaimed.

Int. Cl.[2] C10M *3/46, 3/44*

U.S. Cl. 252—78.3 **18 Claims**

1. In a functional field method comprising converting a first mechanical effort to pressure at a first location, transmitting said pressure from said first location to a second location through use of a hydraulic fluid, and converting said pressure at said second location to a second mechanical effort, the improvement characterized by using as said hydraulic fluid a composition comprising an effective amount of a compound having the formula selected from:

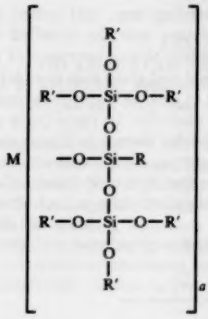
(I)



and

-continued

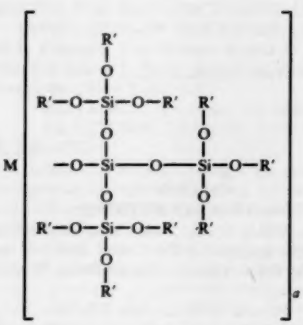
(II)



wherein a = 2, 3 or 4; M is a substituted or unsubstituted branched or straight chain hydrocarbon radical; R is hydrogen, an alkyl, alkenyl, aryl or aralkyl group and each R′ is independently selected from the same group as R with the proviso that at least a majority of R′ radicals are sterically hindered alkyl groups having at least 3 carbon atoms.

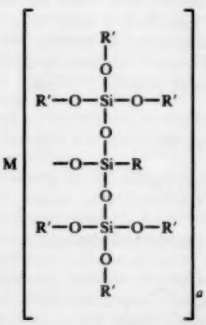
10. In a functional fluid method comprising passing heat from a first heat conductor to a heat transfer fluid at a first location, transmitting the heat from said first location to a second location through use of said heat transfer fluid, the improvement characterized by using a heat transfer fluid comprising an effective amount of a compound having the formula selected from:

(I)



and

(II)



wherein a = 2, 3 or 4; M is a substituted or unsubstituted branched or straight chain hydrocarbon radical; R is hydrogen, an alkyl, alkenyl, aryl or aralkyl group and each R′ is independently selected from the same group as R with the

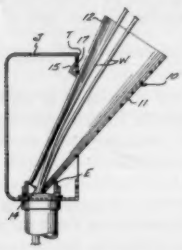
proviso that at least a majority of R′ radicals are sterically hindered alkyl groups having at least 3 carbon atoms.

4,132,665

WIRE FEED FUNNEL

John E. Nelson, 3216 W. Opal, Pasco, Wash. 99301

Filed Jan. 25, 1978, Ser. No. 872,114
Int. Cl.² B65M *59/00*
U.S. Cl. 254—134.3 R **3 Claims**



1. A wire guiding funnel structure adapted for manual installation into a junction box, comprising:

a flexible substantially triangular planar surface convolved to approximate a cone frustum split along one tangential surface gap, the convolution of said surface being biased outwardly to separate the edges thereof along said gap;

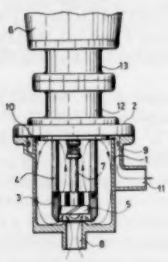
a first and second engaging bracket formed on the exterior of said surface respectively disposed on the opposing edges along said gap, each said bracket being formed in the manner of a cantelevered L member extending from said surface to align an engaging lip towards the base of said frustum, said engaging lips each being formed along a tapered edge, said taper reducing in the direction away from said gap.

4,132,666

PROCESS FOR PREPARING ALKALI METAL DISPERSIONS

Tatsusuke Chikatsu; Shinichi Shimokawa, both of Yokkaichi; Takao Miura, Ibaragi, and Taro Okumura, Yokkaichi, all of Japan, assignors to Japan Synthetic Rubber Company, Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 731,422, Oct. 12, 1976, abandoned. This application Jul. 27, 1977, Ser. No. 819,590
Claims priority, application Japan, Oct. 9, 1975, 50-121981; Sep. 7, 1976, 51-106928
Int. Cl.² B01J *13/00*
U.S. Cl. 252—309 **7 Claims**



1. A process for preparing alkali metal dispersions which comprises continuously feeding a molten alkali metal, a dispersing agent and an inactive dispersion liquid to a multipass emulsifier to form an emulsion of the molten alkali metal, and continuously transferring the resulting emulsion into a container containing a sufficient quantity of a liquid carrier under agitation thereby rapidly cooling the emulsion to a temperature at least 10° lower than the melting point of the alkali metal; the said emulsifier comprising a main cylinder having a cover on its upper end, an auxiliary cylinder located with upper and lower ends open in a middle lower part of the space inside the main cylinder, and a turbine mounted in the auxiliary cylinder to form an upward axial fluid flow, said main cylinder having an inlet formed in the portion facing the bottom of the auxiliary cylinder and also having an overflow gap provided between the entire upper periphery of the main cylinder and the cover and communicated with a discharge pipe surrounding the main cylinder.

4,132,667

CORROSION INHIBITING MOLYBDATE PIGMENT AND PREPARATION THEREOF

Derek G. E. Kerfoot, Great Missenden, England, assignor to Noranda Mines Limited, Toronto, Canada

Filed Oct. 5, 1977, Ser. No. 839,564
Claims priority, application Canada, Apr. 4, 1977, 275423
Int. Cl.² C09D *5/08*; C23F *11/18*
U.S. Cl. 252—387 **23 Claims**

1. A corrosion inhibiting pigment comprising a zinc molybdate compound selected from the group consisting of sodium zinc molybdate, potassium zinc molybdate, ammonium zinc molybdate and mixtures thereof, in combination with a suitable carrier, the proportion of the zinc molybdate compound being such that the Mo content in the pigment is between about 1 and 30% by weight.

10. A process for making a corrosion-inhibiting molybdate pigment comprising stirring a finely particulated carrier material in a solution of sodium molybdate, potassium molybdate, ammonium molybdate or mixtures thereof for sufficient time to allow the molybdate solution to wet the surface of the particles, and subsequently adding at least a stoichiometric amount of a solution containing dissolved zinc ion, in order to effect the formation of a sparingly soluble sodium, potassium or ammonium zinc molybdate salt as a deposit on the substrate particles, and recovering the solid pigment material from the solution.

4,132,668

METHOD OF PREPARING A HYDROGEN-PERMEABLE MEMBRANE CATALYST ON A BASE OF PALLADIUM OR ITS ALLOYS FOR THE HYDROGENATION OF UNSATURATED ORGANIC COMPOUNDS

Vladimir M. Gryaznov, Lomonosovsky prospekt 14, kv. 504; Viktor S. Smirnov, Kutuzovsky prospekt 26, kv. 555; Valentin M. Vdovin, Leninsky prospekt 23, kv. 90; Margarita M. Ermilova, B. Cherkizovskaya ulitsa 10, korpus 2, kv. 103, all of Moscow; Lia D. Gogua, ulitsa Arakishvili 7, kv. 7, Tbilisi; Nina A. Pritula, 3 Frunzenskaya ulitsa 14, kv. 87, and Igor A. Litvinov, ulitsa Delegatskaya 11, kv. 107, both of Moscow, all of U.S.S.R.

Filed Apr. 6, 1977, Ser. No. 785,052
Int. Cl.² B01J *31/28, 31/06*; C07C *5/16*
U.S. Cl. 252—430 **7 Claims**

1. A method for preparing a hydrogen permeable membrane catalyst for the hydrogenation of unsaturated organic compounds comprising:

coating the surface of a metalloceramic material with an organosilicon polymer selected from the group consisting of polyorganosiloxanes and polyorganosilcarbanes, wherein said metalloceramic material is made of a substance selected from the group consisting of nickel, copper, and stainless steel, and has a thickness of about 0.05 to 1 mm; curing said polymer at a temperature of about 20° to 150° C. to form a polymer film having a thickness of about 0.1 to 1 mm; depositing a layer of a substance selected from the group consisting of palladium and palla-

dium alloys to a thickness of about 0.001 to 0.1 micron on said polymer film.

2. The method of claim 1, wherein said layer of palladium or palladium alloy is deposited by means including vacuum sublimation, plasma evaporation, chemical deposition, or anodic deposition.

3. The method of claim 1 wherein said organosilicon polymer is selected from the group consisting of polydimethylsiloxane, methylphenylsiltrimethylene polymer, polymethylsiloxanes, polyphenylsiloxanes, polymethylphenylsiloxanes, methylphenylsilmonomethylene polymer, and methylphenylsildimethylene polymer.

6. A catalyst formed by the method of claim 1.

4,132,669
PROCESS FOR PREPARING PHOSPHOROUS-ALUMINA CATALYSTS USING POLYCARBOXYLIC ACIDS AS EXTRUSION AIDS

Monica E. Choca, Chicago, and Gerald R. Feistel, Hinsdale, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Oct. 6, 1977, Ser. No. 840,076
Int. Cl.[2] B01J *21/04, 27/18*
U.S. Cl. 252—435 **6 Claims**

1. A process for preparing phospha-alumina extrudates having a relatively high crush strength, and relatively reduced pore volume in pores above 600 Å diameter comprising:

A. Preparing a purified phospha-alumina powder comprising on a dry basis 3–30% P_2O_5 and 70–97% Al_2O_3.

B. Mixing said purified phospha-alumina powder with water and from 0.1–15% by weight of a water-soluble polycarboxylic acid containing from 1–10 carbon atoms based on the dry weight of the powder.

C. Adjusting the moisture content of said phospha-alumina powder to an extrudate level so as to allow extrusion; and then,

D. Extruding said phospha-alumina powder to prepare a phospha-alumina extrudate whereby the extrusion rate is improved over phospha-alumina powders not so treated.

4,132,670
METHOD OF PREPARING VANADIUM (IV) PHOSPHATE COMPOSITION WITH HIGH INTRINSIC SURFACE AREA

Kiyoshi Katsumoto, El Cerrito, and David M. Marquis, Lafayette, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 521,604, Nov. 6, 1974, abandoned, which is a continuation of Ser. No. 290,049, Sep. 18, 1972, abandoned. This application Oct. 6, 1976, Ser. No. 729,920
Int. Cl.[2] B01J *27/18*
U.S. Cl. 252—437 **6 Claims**

4. A process for preparing a catalyst having an intrinsic surface area of at least 10 m^2/g which is effective to catalyze the oxidation of a hydrocarbon to maleic anhydride comprising the steps of:

(a) heating vanadium pentoxide with a substantially non-corrosive anhydrous organic liquid reducing agent composed of carbon, hydrogen and oxygen which has the following properties;

(1) contains no olefinic double bonds,

(2) has a carbon atom content in the range from 1 to 20, and

(3) is relatively unreactive toward phosphoric acid, to reduce the vanadium of the vanadium pentoxide to a valence between 4.0 and 4.6 and thereby obtain a vanadium-containing feed;

(b) contacting an orthophosphoric acid with the vanadium-containing feed to form a heterogeneous reaction mixture of suspended vanadium(IV) phosphate,

(c) removing liquid from the heterogeneous mixture to obtain the vanadium(IV) phosphate compound, and

(d) calcining the vanadium(IV) phosphate compound to obtain said catalyst.

4,132,671
PROCESS FOR THE PREPARATION OF CARBON BLACK PELLETS

Günter Deininger, Wulfen, and Werner Soyez, Bottrop, both of Germany, assignors to Veba-Chemie Aktiengesellschaft, Postfach, Germany

Filed Nov. 30, 1977, Ser. No. 856,113
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1976, 2654235
Int. Cl.[2] C01B *31/10;* B01J *21/18*
U.S. Cl. 252—445 **3 Claims**

1. A method for the preparation of carbon black adsorbent pellets of a high specific surface area larger than 600 m^2/g from a carbon black-containing water obtained from the partial combustion or partial gasification of liquid oil combustibles or oil-containing solid combustibles which consists of

contacting said carbon black-containing water with an aggregation medium selected from the group consisting of oils, fats, waxes, distillation residues and mixtures thereof, in a quantity sufficient to aggregate said carbon black;

forming aggregated carbon black pellets in said aggregation medium;

separating said aggregated carbon black pellets from said water;

extracting said aggregated carbon black pellets with an aliphatic, aromatic or isocyclic hydrocarbon solvent having at least 4 carbon atoms, under conditions sufficient to separate said aggregation medium from said carbon black pellets;

drying said carbon pellets at temperatures from 450 to 1100° C.; and

recovering said carbon black adsorbent pellets of high specific surface area.

2. A method for the preparation of carbon black adsorbent pellets of specific surface area of 1000 to 1300 m^2/g which comprises further activating the adsorbent pellets obtained by the method of claim 1 at temperatures of from 800° to 1100° C. and with addition of a gas selected from the group consisting of CO, CO_2 and H_2O.

3. A method according to claim 1 wherein said aggregation medium is heavy oil, said hydrocarbon solvent is low boiling petroleum ether of boiling point 80 to 100° C. and wherein said extraction is a 3-stage extraction with 3 parts by weight of said solvent to 1 part by weight of said aggregated carbon black pellets.

4,132,672
METHANATION CATALYST

Henry Wise, Redwood City, and Bernard Wood, Santa Clara, both of Calif., assignors to American Gas Association, Arlington, Va.

Continuation-in-part of Ser. No. 667,104, Mar. 15, 1976, abandoned. This application Feb. 23, 1977, Ser. No. 771,119
Int. Cl.[2] B01J *21/04, 23/46, 23/74*
U.S. Cl. 252—466 B **1 Claim**

1. A catalyst for the conversion of carbon monoxide and hydrogen to methane consisting essentially of a porous alumina support carrying about 25 percent by weight of metallic nickel catalyst together with from about 0.1 to about 1 percent by weight of iridium, said catalyst having been prepared by depositing the metallic nickel catalyst on the alumina support, impregnating the supported metallic nickel catalyst with an aqueous solution of a water soluble salt of iridium, converting said salt to metallic iridium, and heating the resulting catalyst at a temperature of from about 350° to about 500° C. in the presence of hydrogen for about 4 to about 20 hours.

4,132,673

PROCESS FOR THE PRODUCTION OF A CATALYST

Shigeto Yamaguchi, Tokyo, Japan, assignor to Riken Keiki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 10, 1977, Ser. No. 767,473
Claims priority, application Japan, Mar. 19, 1976, 51-29301; Nov. 26, 1976, 51-141327
Int. Cl.² B01J *21/04, 23/42, 23/44*
U.S. Cl. 252—466 PT 6 Claims

1. A process for the preparation of a catalyst comprises abrading a metallic material selected from platinum, palladium, platinum-palladium alloys and mixtures thereof, in the presence of an aqueous alumina suspension to obtain an aqueous suspension which contains finely divided particles of the metallic material and alumina uniformly dispersed therethrough, applying the thus obtained suspension to a support and then removing the water therefrom to obtain the catalyst.

4,132,674

ELECTROCONDUCTIVE COATING FORMULATION

Mei H. Hwang, Pittsburgh, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

Filed Dec. 21, 1977, Ser. No. 862,997
Int. Cl.² H01B *1/00*
U.S. Cl. 252—500 4 Claims

1. A method for enhancing the solvent holdout properties of methanol soluble electroconductive coating formulations which comprises adding from about 0.5 to about 10% by weight of a methanol soluble or methanol dispersible fluorosurfactant of the formula:

$$F(CF_2)_nCH_2CH_2SCH_2CH_2N^+R_1R_2R_3$$

wherein:
n is an integer of from 4 to 14;
R_1 is an alkyl group of 1 to 4 carbon atoms;
R_2 is an alkyl group of 1 to 4 carbon atoms; and
R_3 is an alkyl group of 1 to 4 carbon atoms or is the covalently bonded anion

to a coating formulation comprising from 60 to about 99% by weight of an electroconductive cationic quaternary ammonium polymer selected from the group consisting of poly-(dimethyldiallylammonium chloride), a copolymer of dimethyl diallyl ammonium chloride and diacetone acrylamide containing from 70 to 98% of diallyl monomer units, polyvinyl benzyl trimethyl ammonium chloride, polymethacryloloxyethyl trimethyl ammonium chloride, polymethacryloloxyethyl trimethyl ammonium methosulfate, polyepichlorohydrin 80 to 100% quaternized with trimethylamine, copolymers of acrylamide and methacryloloxyethyl trimethyl ammonium chloride containing from 90 to 99.5% methacryloloxyethyl monomer, and poly-(methacryloloxyethyl dimethyl hydroxyethyl ammonium chloride) and 0 to about 40% by weight of a pigment.

4,132,675

CIS-OCT-6-EN-1-AL PERFUMES

Ferdinand Näf, Geneva, Switzerland, assignor to Firmenich SA, Geneva, Switzerland

Filed Feb. 2, 1977, Ser. No. 765,056
Claims priority, application Switzerland, Feb. 11, 1976, 1645/76
Int. Cl.² C11B *9/00*
U.S. Cl. 252—522 2 Claims

1. A process for enhancing, improving or modifying the fragrance properties of perfumes which comprises the step of admixing from 0.01% to 2% by weight of cis-oct-6-en-1-al in said perfumes.

4,132,676

PERFUME COMPOSITIONS CONTAINING ETHYL 3,4-DICHLORO-5-ISOTHIAZOLECARBOXYLATE

Joseph A. Virgilio, Wayne, N.J., assignor to Givaudan Corporation, Clifton, N.J.

Filed Dec. 9, 1977, Ser. No. 858,977
Int. Cl.² C11B *9/00*
U.S. Cl. 252—522 5 Claims

1. A perfume base comprising an olfactory effective amount of ethyl 3,4-dichloro-5-isothiazolecarboxylate and at least one other odorant.

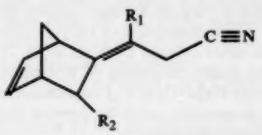
4,132,677

PERFUME COMPOSITIONS CONTAINING 2-(2-CYANOETHYLIDENE)-2-METHYL-BICYCLO(2.2.1-)HEPT-5-ENES

Gary W. Shaffer, Trumbull, Conn., and Kenneth L. Purzycki, Lake Parsippany, N.J., assignors to Givaudan Corporation, Clifton, N.J.

Filed Dec. 15, 1977, Ser. No. 860,660
Int. Cl.² C11B *9/00*
U.S. Cl. 252—522 8 Claims

1. A fragrance composition comprising an olfactory effective amount of a compound of the general formula:



wherein:
R_1 and R_2 may be alike or different and are selected from the group consisting of hydrogen or methyl,
and other perfume additives.

4,132,678

TRANSPARENT LIQUID SHAMPOO

Eiji Iijima, Sakura; Hiroshi Watanabe, Funabashi, and Shizuo Hayashi, Sugito, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Sep. 7, 1976, Ser. No. 720,988
Claims priority, application Japan, Sep. 16, 1975, 50/111859
Int. Cl.² C11D *1/65, 1/14, 1/62*
U.S. Cl. 252—545 5 Claims

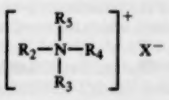
1. A transparent liquid shampoo composition, consisting essentially of

A. from about 10 to about 40 weight percent of an anionic surfactant having the formula

$$R_1—O—(CH_2CH_2O)_nSO_3M$$

wherein R_1 is alkyl having from 10 to 18 carbon atoms, *n* is the average number of added ethylene oxide units and is in the range of from one to 5, with the proviso that compound in which *n* equals zero is from zero to 5 weight percent of the total weight of component A, and M is an alkali metal or an alkanolamine selected from the group consisting of mono-, di- and triethanolamine,

B. from about 0.1 to about 5 weight percent of cationic surfactant having the formula



wherein R_2 is alkyl having 16 to 22 carbon atoms, R_3 and R_4 are methyl or ethyl, R_5 is methyl, ethyl or benzyl, and X is chloro, bromo, iodo or monoethylsulfate, and

C. the balance is essentially water.

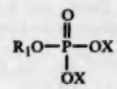
4,132,679

LOW IRRITANT SHAMPOO COMPOSITION

Hisao Tsutsumi, Sakura; Hiroshi Watanabe, Funabashi, and Shizuo Hayashi, Saitama, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Aug. 4, 1977, Ser. No. 821,911
Claims priority, application Japan, Aug. 24, 1976, 51-101005
Int. Cl.[2] C11D *1/38, 3/26, 7/32*
U.S. Cl. 252—545 10 Claims

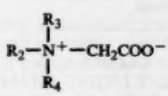
1. A shampoo composition consisting essentially of (A) from one to 40% by weight of one or a mixture of two or more monoalkyl ester salts of phosphoric acid having the formula (1):



(1)

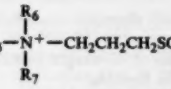
wherein R_1 is straight-chain alkyl having an average carbon atom number of from 10 to 14, straight-chain alkenyl having an average carbon atom number of from 10 to 18, branched-chain or alicyclic alkyl having an average carbon atom number of from 10 to 18, or branched-chain or alicyclic alkenyl having an average carbon atom number of from 10 to 18, and X is selected from the group consisting of hydrogen, alkali metal, ammonium, lower alkyl (C_1 to C_3) ammonium and hydroxyalkyl (C_1 to C_3) ammonium, with the proviso that both X's are not hydrogen simultaneously,

(B) from 0.1 to 40% by weight of one member or a mixture of two or more members selected from the group consisting of trialkylaminoacetobetaines having the formula (2):



(2)

wherein R_2 is alkyl or alkenyl having an average carbon atom number of from 10 to 16 and R_3 and R_4 each is alkyl having from one to 3 carbon atoms, and trialkylaminopropanesulfobetaines having the formula (3):



(3)

wherein R_5 is alkyl having an average carbon atom number of from 10 to 16 and R_6 and R_7 each is alkyl having from one to 3 carbon atoms,
and (C) the balance is essentially water.

4,132,680

DETERGENT COMPOSITIONS HAVING SOIL RELEASE PROPERTIES

Charles H. Nicol, Hamilton, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 699,412, Jun. 24, 1976, abandoned, which is a continuation-in-part of Ser. No. 677,350, Apr. 15, 1976, abandoned, which is a continuation-in-part of Ser. No. 482,948, Jun. 25, 1974, abandoned. This application Apr. 12, 1978, Ser. No. 895,682
Int. Cl.[2] C11D *3/30, 3/37;* D06M *15/10, 15/38*
U.S. Cl. 252—547 23 Claims

1. A laundry detergent composition comprising:

(a) from about 2% to about 95% by weight of a surfactant selected from the group consisting of water-soluble anionic, nonionic, zwitterionic and ampholytic surface-active agents and mixtures thereof; and

(b) from about 0.15% to about 25% by weight of a soil release polymer comprising ethylene terephthalate and polyethylene oxide terephthalate at a molar ratio of ethylene terephthalate to polyethylene oxide terephthalate of from about 65:35 to about 80:20, said polyethylene oxide terephthalate containing polyethylene oxide linking units having a molecular weight of from about 1,000 to about 3,000, the molecular weight of said soil release polymer being in the range of from about 10,000 to about 50,000;

wherein at least 15% of said detergent composition is comprised of surfactant and detergency builder components, and wherein from about 0.05% to about 15% of said composition dissociates, in aqueous solution, yielding quaternary ammonium cations which include at least 1, and not more than 3, chains each containing from 8 to 24 carbon atoms.

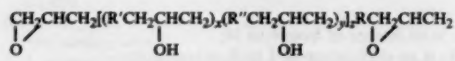
4,132,681

FLUORINATED POLYETHER NETWORK POLYMERS

Donald E. Field, Falls Church, Va., and James R. Griffith, Riverdale Heights, Md., assignors to United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 29, 1976, Ser. No. 736,965
Int. Cl.[2] C08G *59/04*
U.S. Cl. 260—836 5 Claims

1. A polymer of the general formula:



wherein x is an integer from 1 to 4, y is an integer from 1 to 4, z is 1 or more, R′ is selected from the group consisting of the 1,3 and the 1,4 isomers of $—OC(CF_3)_2\phi C(CF_3)_2O—$, R″ is selected from the group consisting of the cis and trans isomers of $—O(CF_3)_2CCH_2CH{=}CH_1C(CF_3)_2O—$ and R is either R′ or R″.

4,132,682

PROCESS FOR PREPARING CATION-EXCHANGE MEMBRANE

Toru Seita; Kenji Takahashi; Shunichi Asami, and Akihiko Shimizu, all of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Filed Jun. 27, 1977, Ser. No. 810,628
Claims priority, application Japan, Aug. 31, 1976, 51/103244
Int. Cl.[2] C08F *259/08, 265/02, 273/00;* C08J *5/22*
U.S. Cl. 521—27 11 Claims

1. A process for preparing a cation-exchange membrane which comprises impregnating a diene monomer having at least one carboxylic acid group or functional group which can be converted to a carboxylic acid group into a fluorinated polymer membrane having cation-exchangeable groups;

partially polymerizing said diene monomer;

swelling said membrane with a water miscible organic solvent and heat-treating the swollen membrane and converting to carboxylic acid groups said functional groups which can be converted to carboxylic acid groups.

4,132,683

PROCESS OF PREPARING POLYFURAN FOAMS

Hans-Ole Larsen, Farum; Sven Barfoed, Copenhagen, both of Denmark, and John A. G. Gent, Liphook, England, assignors to Koninklijke Emballage Industrie Van Leer BV, Amsteleveen, Netherlands

Continuation-in-part of Ser. No. 516,705, Oct. 21, 1974, abandoned, which is a continuation of Ser. No. 288,883, Sep. 13, 1972, abandoned. This application Sep. 27, 1976, Ser. No. 727,325

Claims priority, application United Kingdom, Sep. 15, 1971, 43033/71

Int. Cl.[2] C08J 9/00

U.S. Cl. 521—106 6 Claims

1. In a process for preparing polyfuran foams by polymerizing or copolymerizing furfuryl alcohol, either alone or in combination with prepolymers or precopolymers of furfuryl alcohol, as liquid feed material in the presence of a liquid acidic compound or mixture of acidic compounds, the improvement which comprises:

(a) utilizing as the liquid feed material a furfuryl alcohol-containing mixture containing at least 20% of free furfuryl alcohol substantially free of other alcohols, wherein at least 50% of the hydroxyl groups in the mixture are present as free furfuryl alcohol, said mixture having a maximum viscosity of 1150 cp at 25° C. when containing about 50% hydroxyl groups as free furfuryl alcohol; and

(b) adding at least 6% by weight of an oxy-acid of phosphorous as the acidic compound or mixture of acidic compounds to the feed material; said acidic compound or mixture of acidic compounds having a pKa value in water of from 1 to 4; to obtain a stable, low density polyfuran foam having non-flammability characteristics as determined by the muffle furnace test.

4,132,684

GRAFT COPOLYMER COMPOSITION OF STYRENE-POLYPHENYLENE ETHER AND PREPARATION THEREOF

Shinichi Izawa, Tokyo; Jurou Ohzeki, Yokohama; Tsuyoshi Yahata, Kawasaki, and Atsuo Nakanishi, Kanagawa, all of Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

Filed Feb. 7, 1977, Ser. No. 766,514

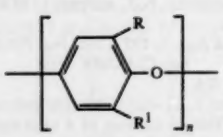
Claims priority, application Japan, Feb. 10, 1976, 51-12846; Dec. 27, 1976, 52-156567

Int. Cl.[2] C08L 7/00

U.S. Cl. 260—4 AR 37 Claims

1. A thermoplastic resin composition comprising:

(I) a graft copolymer having a styrene polymer grafted onto a polyphenylene ether of the formula:



wherein, R and R^1 each denote a hydrogen atom or an alkyl group having one to four carbon atoms and n is the degree of polymerization and containing substantially no homopolymer of polyphenylene ether; and,

(II) a graft copolymer having a styrene polymer grafted onto a copolymer of ethylene with 1.0 to 40 mol percent of at least one unsaturated compound of the formula $CH_2{=}CH{-}OCOR_1$ or $CH_2{=}CR_2{-}COOR_3$, wherein R_1 denotes an alkyl group having one to four carbon atoms and each of R_2 and R_3 a hydrogen atom or an alkyl group having one to four carbon atoms, the amount of said polyphenylene ether being from 20 to 85% by weight and that of said copolymer of ethylene being from 3 to 40% by weight based on the final composition.

4,132,685

FILLED, THERMOPLASTIC WORKHOLDING COMPOSITION INCLUDING A DICARBOXYLIC ACID, AN ALKYLENE HYDROCARBON POLYMER, AND AN AROMATIC HYDROCARBON POLYMER

Fred B. Speyer, Euclid, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed Oct. 3, 1977, Ser. No. 838,481

Int. Cl.[2] C08L 1/28

U.S. Cl. 260—17 R 13 Claims

1. A normally solid thermoplastic hot melt composition comprising a dispersion of from 5% to 70% by weight of an inorganic portion which is a finely divided inorganic filler having a particle size such that 95% passes through a 200 mesh standard screen, and from 95% to 30% by weight of an organic portion which is a blend of

(a) 5 to 20 parts by weight of an aliphatic dicarboxylic acid containing from 32 to 40 carbon atoms;

(b) from 10 to about 20 parts by weight of a nonpolar C_5–C_6 alkylene hydrocarbon polymer having a molecular weight in the range of from about 1000 to about 1400 and having a softening point of from about 95° F. to 120° F. measured by the ring and ball method;

(c) from 10 to 20 parts by weight of a nonpolar, aromatic hydrocarbon polymer having a softening point in the range of from about 98° to 115° C. measured by the ring and ball method and a viscosity at 25° C. as a 70% solution in toluene of R-U Gardner-Holdt;

(d) from 2.5 to 8 parts by weight of a C_1–C_3 alkyl cellulose ether;

(e) from 2 to 5 parts by weight of a C_{10}–C_{20} monocarboxylic saturated fatty acid, unsaturated monobasic carboxylic acid or mixtures thereof the amount of said inorganic filler on a volume basis being less than the critical pigment volume concentration of the inorganic filler in said organic portion.

4,132,686

PROCESS FOR COATING EMPLOYING A TWO-PACK TYPE AQUEOUS PAINT COMPOSITION

Kazuaki Toyoshima, Sakura; Michitoshi Koyanagi, Narashino, and Tameyuki Suzuki, Zushi, all of Japan, assignors to Shinto Paint Co., Ltd., Amagasaki, Japan

Filed Feb. 3, 1977, Ser. No. 765,360

Int. Cl.[2] B44D 1/44; C09D 3/52, 3/64

U.S. Cl. 260—21 15 Claims

1. In a process for coating a surface wherein an aqueous paint composition containing as the primary film-forming components: a synthetic polycarboxylic acid resin as the main binder component; an amino resin as a heat curing cross-linking agent for the polycarboxylic acid resin and a neutralizing agent for neutralizing the acid groups of the polycarboxylic acid resin, is applied to said surface and is thereafter heat cured by baking; the improvement comprising: applying the aqueous paint composition to the surface prior to heat curing as two separate compositions (A) and (B); said (A) comprising a synthetic polycarboxylic acid resin which has a number average molecular weight of above 2000 and an acid value of 10–150 and which is neutralized to a neutralization degree of 30–70%, and, as a heat curing cross-linking agent, an amino resin, the ratio of amino resin/polycarboxylic acid resin being 10/90 to 35/65; and said (B) comprising a synthetic polycarboxylic acid resin which has a number average nolecular weight of above 2000 and an acid value of 10–150 and which is neutralized to a neutralization degree 30–80% higher than that of the polycarboxylic acid resin of (A), and, as a heat curing cross-linking agent, an amino resin, the ratio of amino resin/polycarboxylic acid resin being 10/90 to 35/65.

4,132,687

NONIONICALLY/CATIONICALLY STABILIZED AQUEOUS EMULSIONS AND PROCESS THEREFOR

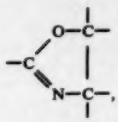
Klaus Behmel; Wolfgang Schmut, and Bertram Zäckert, all of Graz, Austria, assignors to Vianova Kunstharz, A.G., Graz, Austria

Filed Mar. 10, 1977, Ser. No. 776,431
Claims priority, application Austria, Mar. 17, 1976, 1982/76
Int. Cl.[2] C09D *3/64, 3/727, 5/02*
U.S. Cl. 260—22 A 18 Claims

1. A nonionically/cationically stabilized aqueous emulsion of stoving paint binders, said binders including at least one film-forming polymeric resin suitable for use in a protective coating composition; and said paint binders including as nonionic and cationic moieties, calculated on binder solids, of from about 1–20 percent by weight of nonionic structural units of the formula

$$-O-[CH_2-CH_2-O]_n-$$

n being an integer of from about 5–100, and of from about 0.05–3 moles/kg of oxazoline structural units of the formula



and being partially or totally neutralized with acids.

4,132,688

AQUEOUS DISPERSION THERMOSETTING COATING COMPOSITIONS BASED ON AQUEOUS EMULSION COPOLYMERS CONTAINING TWO SOURCES OF HYDROXY FUNCTIONALITY

Donald J. Berenschot, Chicago; Dale F. Anders, Des Plaines, and Fred D. Hawker, Villa Park, all of Ill., assignors to DeSota, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 192,565, Oct. 26, 1971, abandoned, and Ser. No. 351,453, Apr. 16, 1973, abandoned. This application Apr. 7, 1977, Ser. No. 785,664
Int. Cl.[2] C09D *3/52, 3/66;* C08L *61/28*
U.S. Cl. 260—22 CB 25 Claims

1. An aqueous latex dispersion thermosetting coating composition comprising water having dispersed therein;

(1) an aqueous emulsion copolymer of ethylenically unsaturated materials consisting essentially, based on the weight of the copolymer, of:

(A) at least about 70% by weight of monoethylenically unsaturated monomers free of functional groups other than said monoethylenic saturation; and

(B) from 5–30% by weight of non-nitrogenous hydroxy functional ethylenically unsaturated materials including:

a. 2–20% of monoethylenically unsaturated monomer containing only hydroxy groups; and

b. 2–20% of hydroxy-terminated polyethylenically unsaturated polyester having an hydroxy number of from 100 to 350, said ethylenically unsaturated materials being copolymerized in aqueous emulsion in admixture with from 0.05% to about 5%, based on the weight of the copolymer, of mercaptan; and

(2) from about 3% to about 40%, based on the total weight of resin solids, of an aminoplast resin.

4,132,689

THERMOPLASTIC WORKHOLDING COMPOSITION AND METHOD OF HOLDING A WORKPIECE

Fred B. Speyer, Euclid, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed Oct. 3, 1977, Ser. No. 838,488
Int. Cl.[2] B24B *19/14;* C08L *91/00*
U.S. Cl. 260—23 R 19 Claims

1. A normally solid thermoplastic hot melt composition comprising a dispersion of from 5% to 70% by weight of an inorganic moiety which is a finely divided inorganic filler having a particle size such that 95% passes through a 200 mesh Standard screen and from 95% to 30% by weight of an organic moiety which is a blend of:

(a) 5 to 20 parts by weight of an aliphatic dicarboxylic acid containing from 32 to 40 carbon atoms;

(b) From 10 to about 20 parts by weight of a C_5–C_6 alkylene hydrocarbon polymer having a molecular weight in the range of from about 1000 to about 1400; and

(c) 10 to 20 parts by weight of a nonpolar aromatic hydrocarbon polymer having a softening point in the range of from about 98° to 115° C. measured by the ring and ball method;

the amount of said inorganic filler on a volume basis being less than the CPVC of the inorganic filler in said organic moiety.

4,132,690

ADHESIVE POLYAMIDE RESIN COMPOSITIONS CONTAINING HIGH ACID NUMBER COPOLYMERS

Tjeerd Eernstman, Augsburg, Germany; Christopher J. Auger, Tervuren, Belgium, and Emile M. Devroede, Buizingen, Belgium, assignors to Allied Chemical Corporation, Morristown, N.J.

Filed Sep. 27, 1976, Ser. No. 727,311
Int. Cl.[2] C09J *3/14*
U.S. Cl. 260—23 AR 14 Claims

1. An adhesive composition comprising a compatible admixture of:

(a) about 15 to 99 weight percent of a conventional polyamide adhesive base component; and correspondingly

(b) about 85 to 1 weight percent of a normally solid, homogeneous copolymer of ethylene and an unsaturated carboxylic acid having an acid number of at least about 100 and a number average molecular weight between 500 and 5,000, said copolymer containing at least a major portion of ethylene by weight.

4,132,691

LUBRICANT COMPOSITION FOR VINYL CHLORIDE POLYMERS

Adam J. Ejk, Piscataway, N.J., assignor to M&T Chemical Inc., Stamford, Conn.

Filed Apr. 6, 1977, Ser. No. 784,961
Int. Cl.[2] C08K *5/09*
U.S. Cl. 260—23 XA 11 Claims

1. An improved rigid vinyl chloride polymer composition comprising an effective amount of a heat stabilizer for vinyl chloride polymers, a vinyl chloride polymer and an effective amount of an additive for imparting lubricity and additional heat stability to said composition, wherein the improvement resides in said additive being a synergistically active mixture of (1) an organic wax selected from the group consisting of oxidized polyethylene, copolymers of ethylene with monoethylenically unsaturated carboxylic acids or esters thereof and esters derived from (a) monocarboxylic acids containing from 8 to 20 carbon atoms and (b) alcohols containing from 1 to 12 carbon atoms, the concentration of free carboxylic acid or ester groups in said organic wax being from 0.03 to 0.5 equivalent weight of said acid or ester per 100 grams of vinyl chloride polymer, and (2) a basic compound selected from the group consisting of oxides and hydroxides of tin, antimony and elements in groups II-A, III-A, and IV-B of the periodic table of

the elements, the concentration of said basic compound being from 0.1 to 5 parts by weight per 100 parts of said vinyl chloride polymer and in excess of the stoichiometric amount required to react with the carboxylic acid or ester groups present in said organic wax.

4,132,692

AQUEOUS COATING AGENT FOR STOVING BASED ON AQUEOUS DISPERSION OF EPOXIDE RESIN MIXTURES AND EPOXIDE CURING AGENTS, PROCESS FOR THE MANUFACTURE THEREOF AND THE USE THEREOF

Wolf-Dieter Görlitz, Hamburg, and Bernhard Broecker, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 19, 1977, Ser. No. 760,359

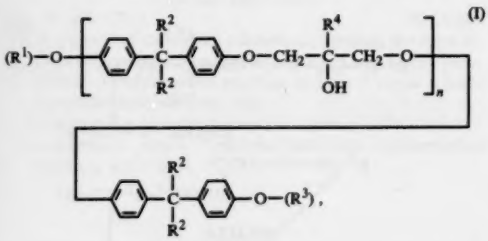
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1976, 2602255

Int. Cl.[2] C08L 63/00

U.S. Cl. 260—29.2 EP **2 Claims**

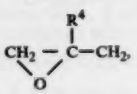
1. A process for the manufacture of an aqueous coating agent containing an aqueous dispersion of a mixture of epoxide resin as a binder and an epoxide resin curing agent which comprises reacting a mixture containing said epoxide resin and curing agent wherein the epoxide resin binder is an epoxide resin mixture of at least one epoxide resin selected from the group consisting of

(a) epoxide resins of the formula I

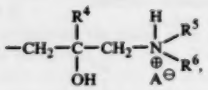


(I)

wherein R^1 denotes the radical



R^2 and R^4 denote H or CH_3 and R^3 denotes the radical



$A^{\ominus}$ representing the anionic radical of a monocarboxylic acid, and R^5 and R^6 having the following meanings:

when R^5 is:	R^6 is:
H	$-CH_2CH_2OH$
H	$-CH_2CH(OH)CH_3$
$-CH_2CH_2OH$	$-CH_2-CH_2OH$
$-CH_2-CH(OH)CH_3$	$-CH_2-CH(OH)CH_3$

and n denotes values from 1.3 to 13; and solid epoxide resins of the formula V

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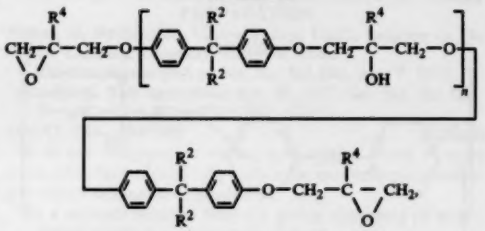
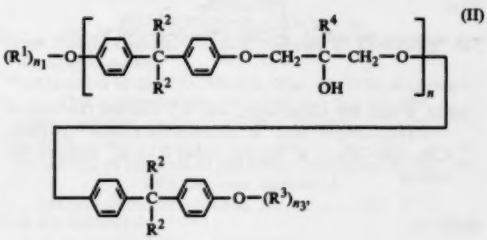


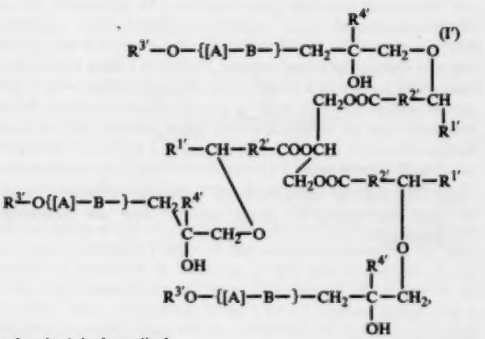
wherein R^4 and R^2 denote H or CH_3 and n has a value from 1.3 to 13, the resins having epoxide equivalent weights from 300 to 2,000 and the softening points by the Durrans method being between 50 and 125° C, the mixture of epoxide resins of the formula I and V having the condition that the obtained epoxide resin mixture a' of the formula II



(II)

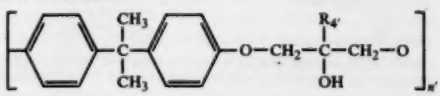
wherein R^1, R^2, R^3R^4, R^5, n and $A\ominus$ have the meaning already mentioned and the sum of n_1 and n_3 has the value 2 and the ratio of n_1:n_3 has values from 20 to 0.1, preferably from 10 to 0.1, and

(b) an epoxide resin mixture consisting of epoxide resins of the formula I'

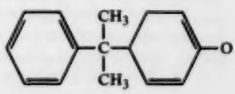


(I')

wherein A is the radical



when B represents the radical



(V) or A is the radical

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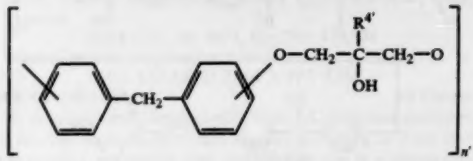
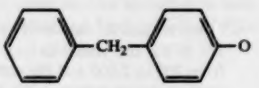
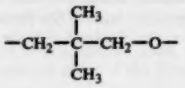


when B represents the radical

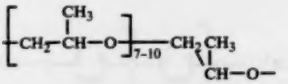


or A represents the radical

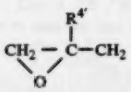


when B has the value zero,

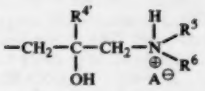
or A represents the radical



when B has the value zero, and $R^{1'}$ denotes the radical $-(CH_2)_5-CH_3-$ and $R^{2'}$ denotes the radical $-(CH_2)_7-CH=CH-CH_2-$, n' has the value 0 to $R^{3'}$ denotes the radical



or the radical



and wherein the last-mentioned grouping is present in at least one radical $R^{3'}$ and R^5 and R^6 have the following meanings:

when R^5 is:	R^6 is:
H	$-CH_2CH_2OH$
H	$-CH_2CH(OH)CH_3$
$-CH_2CH_2OH$	$-CH_2-CH_2OH$
$-CH_2-CH(OH)CH_3$	$-CH_2-CH(OH)CH_3$

and $A\ominus$ represents the anionic radical of a monocarboxylic acid, and epoxide resins of the formula V'

(V')

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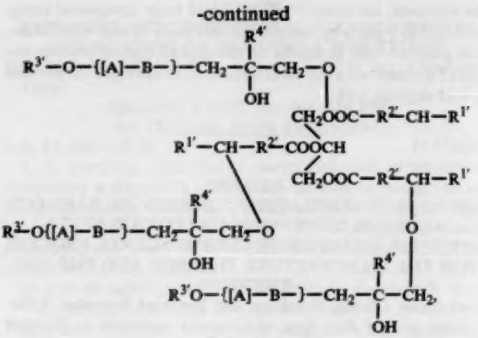
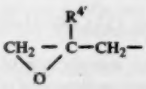
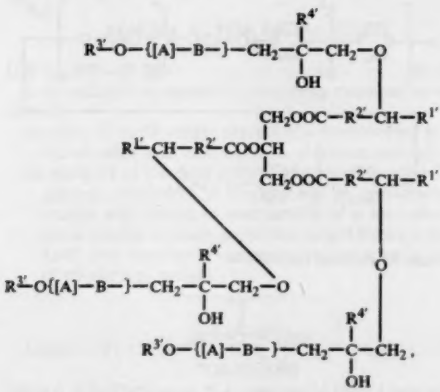


wherein $R^{3'}$ has the meaning

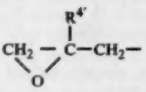


and $R^{1'}$, $R^{2'}$, $R^{4'}$, A, B and n' have the meaning already mentioned and the resins have epoxide equivlaent weights of approximately 440 to approximately 4,000, the mixture of epoxide resins of the formula I' and V' having the condition that the obtained apoxide resin mixture b' of the formula II'

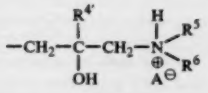
(II')



wherein R^1, $R^{2'}$, $R^{4'}$, $R^{5'}$, $R^{6'}$, A, B and $A\theta$ have the meaning already mentioned, wherein
$R^{3'}$ denotes the radical



or the radical



and the last-mentioned grouping is represented by a proportion of at least 10% and at most a proportion of 95%, at 50° to 100° C, while stirring, with 0.1 to 1.0 mol, relative

to 100 g of the epoxide resin mixture, of an alkanolamine or dialkanolamine having the formula VI

(VI)

wherein R_5 and R_6 have the meaning mentioned above, in the presence of at least one inert organic solvent selected from the group consisting of toluene, n-butanol and mixtures of toluene and n-butanol, and 0.01 to 1.0 mol of monocarboxylic acid, relative to 100 g, of epoxide resin mixture, having a pKa value of 2 to 5 is added to the resulting reaction product, it being necessary that the equivalent ratios of monocarboxylic acid to alkanolamine or dialkanolamine is 0.7:1 to 3:1, adding water to the resulting mixture while mixing vigorously at 20 to 70° C, and removing the organic solvent present in the mixture by azeotropic distillation thereof with water under vacuum pressure at 30° to 60° C.

4,132,693

CATECHOL MODIFIED RESORCINOL-FORMALDEHYDE LATEX CORD DIP

Roop S. Bhakuni, Copley, and Richard F. Laske, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jun. 7, 1977, Ser. No. 804,403

Int. Cl.[2] C08L *61/12*

U.S. Cl. 260—29.3 **10 Claims**

1. A process of making an adhesive comprising the steps of:

(a) reacting together catechol, an aldehyde, and an inorganic base in a condensation reaction to form a water soluble catechol/aldehyde resin, and

(b) mixing the resin from step (a) together with a mixture comprising water, resorcinol/aldehyde condensation product, and a latex.

4,132,694

METHOD FOR IMPROVING THE LATENT GLASS OF LATEX PAINTS

Rudi Heyden, Erkrath; Adolf Asbeck; Michael Eckelt, both of Dusseldorf, and Wolfgang Gress, Wuppertal-Elberfeld, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Dusseldorf, Fed. Rep. of Germany

Filed Dec. 9, 1976, Ser. No. 748,734

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1975, 2557954

Int. Cl.[2] C08L *33/08*

U.S. Cl. 260—29.6 R **10 Claims**

1. A method of improving the latent gloss property of gloss latex paint, which comprises uniformly distributing in said paint an effective amount of an agent for inhibiting the formation of bubbles in said paint when said paint is applied to a surface, said agent comprising a fluid dispersion wherein the continuous phase is an inert organic liquid or water and the dispersed phase is a mixture of (A) a wax-like ester selected from the group consisting of esters of hydroxystearyl alcohol with saturated fatty acids or with hydroxy fatty acids of C_{16-22} chain length, and of hydroxystearic acid with fatty alcohols of C_{16-22} chain length, and a mixture thereof with the diesters of C_{16}-C_{22} fatty acids with polyethylene glycol, and (B) and effective fortifying amount therefor of a 1:½-3:½-4 molar ratio castor oil: ethylene oxide: propylene oxide adduct; the particles of said dispersed phase being of colloidal dimensions, and the weight ratio between (A) and (B) being between 1:20 and 2:1.

4,132,695

ABSORBENT ARTICLES AND METHODS FOR THEIR PREPARATION

Nelson D. Burkholder, Castro Valley, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 565,880, Apr. 7, 1975, abandoned. This application Apr. 29, 1977, Ser. No. 792,163

Int. Cl.[2] C08L *33/02*

U.S. Cl. 260—29.6 NR **8 Claims**

1. A low temperature curing composition useful to form water absorbent articles of a carboxylic synthetic polyelectrolyte which comprises a solution of

(1) a member selected from the group consisting of water, lower alcohols, and mixtures thereof,

(2) about 5 to about 60% by weight based on the amount of (1) of a carboxylic polyelectrolyte or mixture thereof, and

(3) about 0.5 to about 5.0 percent based on the weight of the polyelectrolyte of a water soluble polyamidopolyamine/epichlorohydrin adduct which is sufficient to cure said polyelectrolyte into a useful water absorbent article.

4,132,696

POLYESTER PLASTICIZERS

Frank Lamb, Oldham, England, assignor to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 559,934, Mar. 19, 1975, abandoned. This application Oct. 15, 1976, Ser. No. 732,627

Claims priority, application United Kingdom, Mar. 28, 1974, 13772/74

The portion of the term of this patent subsequent to Dec. 19, 1995, has been disclaimed.

Int. Cl.[2] C07C *69/76*; C08K *5/11, 5/12*; C08L *27/06*

U.S. Cl. 260—31.6 **14 Claims**

1. A compound having the formula

$$M(P)_a(D)_b(L)_cM \qquad (I)$$

in which M is the residue of one or more aliphatic monocarboxylic acids containing from 4 to 18 carbon atoms, P is the residue of one or more saturated straight or branched chain aliphatic diols containing from 2 to 6 carbon atoms, D is the residue of one or more acids or anhydrides selected from the group consisting of o-phthalic acid, phthalic anhydride, isophthalic acid, hexahydrophthalic acid, hexahydrophthalic anhydride and any of the aforementioned acids or anhydrides substituted with 1 to 4 alkyl groups, said alkyl groups containing 1 to 4 carbon atoms, L is the residue of one or more saturated hydroxy acids containing from 6 to 12 carbon atoms, each of the residues being joined together by ester linkages, residues, P, D and L being distributed at random throughout the molecule, a, b and c each having a value greater than 0, the amount of residue of hydroxy acid being from 10 mole % to 90 mole % based on the total number of moles of reactants and the molar ratios of the remaining reactants being chosen so that the average molecular weight of the product is from 500 to 1400, which is prepared by reacting in one step a mixture of the following components (a) from 10 to 90 mol % of lactone or hydroxy acid containing from 6 to 12 carbon atoms, (b) a hydroxylic component which comprises one or more saturated straight or branched chain aliphatic diols containing from 2 to 6 carbon atoms, (c) an acidic component which comprises one or more acids or anhydrides selected from the group consisting of o-phthalic acid, phthalic anhydride, isophthalic acid, hexahydrophthalic acid, hexahydrophthalic anhydride and any of the aforementioned acids or anhydrides substituted with 1 to 4 alkyl groups, said alkyl groups containing 1 to 4 carbon atoms, and (d) one or more aliphatic monocarboxylic acids containing from 4 to 18 carbon atoms, such that the hydroxylic component is used in stoichiometric amounts or up to 20% excess over the stoichiometric amounts related to the acidic components.

14. A composition comprising (a) a thermoplastic polymer

selected from the group consisting of the poly(vinyl chloride) and poly(vinyl chloride) copolymers and (b) a plasticizing amount up to 60% by weight of the plasticized composition of a compound according to claim 1.

4,132,697

POLYEPOXY RESIN-DIARYL DIANHYDRIDE LAMINATING RESINS AND LAMINATES

Walter P. Barie, Jr., Shaler Township, Allegheny County, and Norman W. Franke, Penn Hills Township, Allegheny County, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation of Ser. No. 531,186, Dec. 9, 1974, Pat. No. 3,996,105, which is a division of Ser. No. 310,412, Nov. 29, 1972, Pat. No. 3,914,512. This application Jun. 10, 1976, Ser. No. 694,848

The portion of the term of this patent subsequent to Dec. 7, 1993, has been disclaimed.

Int. Cl.[2] C08K *5/07*

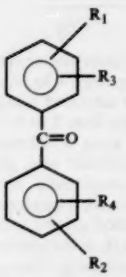
U.S. Cl. 260—32.8 EP **4 Claims**

1. A method for making a liquid epoxy resin-diaryl dianhydride impregnant for binding fibrous reinforcing material which comprises

(1) a nonplasticizing 1,2-epoxy resin which contains on the average more than one 1,2-epoxy group per molecule,

(2) an anhydride hardener comprising

from about 15 to about 100 weight percent of a diphenyl dianhydride having the structural formula



where R_1 and R_2 are the anhydride group; and where R_3 and R_4 are monovalent radicals selected from hydrogen, an alkyl group having between one and five carbon atoms, and a halogen; and

up to about 85 percent of a nonplasticizing monoanhydride,

(3) a solvent having a boiling point no greater than about 110° C. selected from a lower alkyl ketone having up to five carbon atoms, a lower alkyl carboxylic acid ester having up to five carbon atoms, a chlorinated hydrocarbon having up to two carbon atoms, an aromatic hydrocarbon having up to seven carbon atoms, and a mixture thereof, and

(4) about 0.5 to about 5.0 parts of an anhydride accelerator per hundred parts of resin,

the steps comprising

(a) mixing said epoxy resin, anhydride hardener, anhydride accelerator, and solvent, and

(b) heating said mixture of epoxy resin, anhydride hardener, anhydride accelerator and solvent with stirring at the reflux temperature of said solvent and no higher than about 110° C. until solution is obtained.

4,132,698

ELASTOMERIC THERMOPLASTICS

Albert M. Gessler, Cranford, and Edward N. Kresge, Watchung, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 604,210, Mar. 20, 1974, abandoned. This application Feb. 22, 1977, Ser. No. 770,456

Int. Cl.[2] C08K *5/01*

U.S. Cl. 260—33.6 AQ **23 Claims**

1. A nonhomogeneous, gel-free, noncrosslinked elastomeric thermoplastic blend comprised of:

(a) about 15 to 70 parts by weight of one or more C_2 to C_8 crystalline polyolefins having a crystallinity of more than 25 weight percent and a viscosity of about 1×10^2 to 1×10^7 poise at 225° C. at a shear rate of 10^2 sec.$^{-1}$;

(b) about 85 to 30 parts by weight of one or more gel-free, noncrosslinked elastomers having a viscosity, when measured at 225° C., higher than the viscosity of the crystalline polyolefin of (a) above and having a crystallinity less than about 25 weight percent; and

(c) about 5 to 100 parts by weight of a hydrocarbon oil per 100 parts of elastomer and wherein said oil is selected from the group consisting of naphthenic and paraffinic oil.

4,132,699

PHENOL FORMALDEHYDE RESINS, THEIR MANUFACTURE AND USE

Richard N. Bannister, and Frank Hardwick, both of Sheffield, England, assignors to British Steel Corporation (Chemicals) Ltd., Chesterfield, England

Filed Jan. 24, 1977, Ser. No. 761,755

Claims priority, application United Kingdom, Jan. 28, 1976, 3367/76

Int. Cl.[2] C08G *8/10, 8/28*

U.S. Cl. 260—38 **18 Claims**

1. A process for making a liquid phenol formaldehyde resin comprising reacting formaldehyde with a molar excess of phenol in the presence of a catalyst for novolak formation and terminating the reaction when the resultant novolak reaction product is a liquid having a viscosity of from 40 to 200 cp.

4,132,700

PROCESS FOR PREPARING FILLED POLYVINYL CHLORIDE COMPOSITIONS

Ruth E. Stephens, deceased, late of Royal Oak, Mich., and by William L. Stephens, executor, Mount Brydges, Canada, assignors to Ethyl Corporation, Richmond, Va.

Filed Feb. 4, 1976, Ser. No. 655,125

Int. Cl.[2] C08K *9/02*

U.S. Cl. 260—42.14 **15 Claims**

1. In a process for reinforcing polyvinyl chloride compositions the step consisting essentially of adding to said polyvinyl chloride compositions finely divided talc particles, said talc particles having been pretreated with an acid wash solution.

4,132,701

METHOD OF MANUFACTURING A RESIN CONCRETE

Claude Tapis, Villa Rosiris, 34000 Montpellier, France

Filed Jun. 10, 1977, Ser. No. 805,542

Int. Cl.[2] C08K *3/22, 9/02*

U.S. Cl. 260—42 **3 Claims**

1. A process for the production of a resin-based concrete which comprises mixing

(i) an inert filler

(ii) a thermoplastic resin selected from the group consisting of polyethylene, polyvinylchloride and polystyrene, the thermoplastic resin being present in an amount within the range of 2–12% inclusive by weight of the inert filler

(iii) alumina present in an amount within the range 1–6% by weight of the thermoplastic resin.

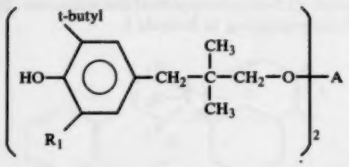
4,132,702

PHENOL ESTERS AND AMIDES AND POLYMERS STABILIZED THEREWITH

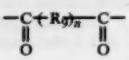
Andreas Schmidt, Reinach, and Kurt Schwarzenbach, Pfeffingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 561,394, Mar. 23, 1975, abandoned. This application Jul. 27, 1976, Ser. No. 709,135
Claims priority, application Switzerland, Mar. 27, 1974, 4282/74
Int. Cl.[2] C08K *5/34, 5/45, 5/11, 5/12*
U.S. Cl. 260—45.8 N 21 Claims

1. A compound of the formula



wherein R_1 is alkyl having 1–4 carbon atoms and A is a group of the formula



wherein n is 0 or 1, and R_9 is a direct bond, a straight-chain or branched alkylene group having 1 to 8 carbon atoms, a thioalkylene group having 2 to 4 carbon atoms, a phenylene group, or a straightchain or branched alkylenedioxy group having 2 to 6 carbon atoms.

10. An organic composition of matter stabilized against thermo-oxidative degradation by incorporating therein a stabilizer of claim 1.

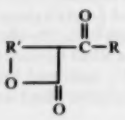
4,132,703

STABILIZATION OF VINYL CHLORIDE POLYMERS BY MEANS OF LACTONE COMPOUNDS

Michel M. Crochemore, Oullins, and Michel M. Gay, Lyon, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Oct. 12, 1976, Ser. No. 731,435
Claims priority, application France, Oct. 14, 1975, 75 31949
Int. Cl.[2] C07D *309/30;* C08K *5/09, 5/15*
U.S. Cl. 260—45.8 A 12 Claims

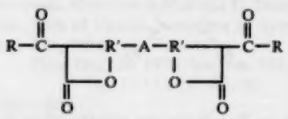
1. A stabilizer composition for polyvinyl chloride resin compositions comprising (a) 0.1 to 5 weight percent based upon the weight of the resin of at least one divalent metal salt of an organic carboxylic acid and (b) 0.05 to 5 weight percent based upon the weight of the resin of at least one α-acyl-lactone selected from the group consisting of those having the formula:



[I]

said lactone ring being from 5- to 9-membered; wherein R is selected from the group consisting of an aliphatic hydrocarbon radical having from 2 to 30 carbon atoms and phenyl; and R′ is a polymethylene bridge of the formula:

Wherein n is an integer from 2 to 6, R_1 and R_2 are independently selected from the group consisting of hydrogen, alkyl, aryl, arylalkyl and cycloaliphatic, and wherein any R_1 or R_2 depending from any given methylenic carbon in the bridge may, together with any R_1 or R_2 depending from an adjacent methylenic carbon in the bridge, be joined to form a carbocyclic ring fused to the lactone ring, and further wherein the total number of carbon atoms in said polymethylenic bridge ranges from between 2 to 30; and those having the formula:



[II]

wherein each R and R′ is as defined above, and A is a member selected from the group consisting of a divalent aliphatic radical, a divalent aromatic radical, an oxygen atom interrupted divalent aliphatic radical, a carboxyl interrupted divalent aliphatic radical, and an oxygen atom interrupted divalent aromatic radical, and further wherein the total number of carbon atoms in the radicals R′ and A does not exceed 30 and each of the lactone rings comprising the lactone of the formula being from 5- to 9-membered.

8. A heat stabilized polyvinyl chloride resin composition comprising a polyvinyl chloride polymer and said stabilizer composition of claim 1.

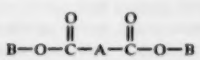
4,132,704

BIS-HETEROCYCLIC BENZOATE ULTRAVIOLET STABILIZERS AND THEIR USE IN ORGANIC COMPOSITIONS

Gether Irick, Jr., and Charles A. Kelly, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

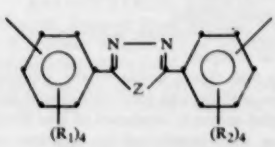
Division of Ser. No. 837,777, Sep. 29, 1977, Pat. No. 4,089,874, which is a division of Ser. No. 657,510, Feb. 12, 1976, Pat. No. 4,069,227, which is a division of Ser. No. 484,843, Jul. 1, 1974, Pat. No. 3,963,738. This application Feb. 21, 1978, Ser. No. 879,572
Int. Cl.[2] C08K *5/34, 5/46, 5/47*
U.S. Cl. 260—45.8 NT 6 Claims

1. An organic composition susceptible to ultraviolet light degradation stabilized against such degradation with a stabilizing amount of at least one aryl ester of a heterocyclic aromatic acid having the formula:



wherein

A has the structure



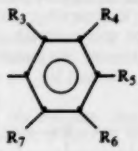
wherein

Z is a sulfur atom or a nitrogen atom containing a hydrogen

atom, a lower alkyl group having 1 to 12 carbon atoms, or benzyl;

R_1 and R_2 are hydrogen, chloro, bromo, lower alkyl or cyano, and are present on all positions of the benzenoid rings, except the carbon atom attached to the carboxyl group connecting the heterocyclic aromatic A group with the aromatic B group, and the carbon atom connected to the heterocyclic ring said carboxyl connecting group being attached to the benzenoid ring in either the meta or para position from the carbon atom connected to the heterocyclic ring;

B is a group having the formula



wherein

at least one R_3 or R_7 is hydrogen and the other R_3, R_4, R_5, R_6 and R_7 are hydrogen, lower alkyl, lower alkoxy, hydroxy, cyano, chloro and bromo.

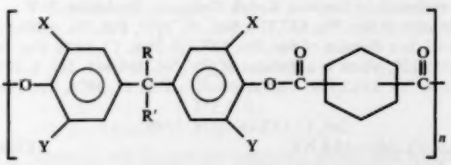
4,132,705

PROCESS FOR PREPARING A HALOGENATED AROMATIC POLYESTER HAVING A PREDETERMINED MOLECULAR WEIGHT BY SOLUTION POLYMERIZATION TECHNIQUE

Robert W. Stackman, Morristown; Arnold J. Rosenthal, Whippany, and Marvin L. Sakowitz, East Brunswick, all of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Jul. 28, 1977, Ser. No. 819,727
Int. Cl.[2] C08G *63/22*
U.S. Cl. 526—60 **37 Claims**

1. A process for preparing a halogenated aromatic polyester having a predetermined molecular weight and of the recurring structural formula:



where X which may be the same or different is chlorine or bromine, Y which may be the same or different is hydrogen, chlorine or bromine, R and R' may be the same or different and represent lower alkyl groups, hydrogen, or together constitute a cyclic hydrocarbon group, and n equals at least 10, by the solution polymerization of a halogenated bisphenol and a diacid halide selected from the group consisting of isophthaloyl chloride, terephthaloyl chloride and mixtures thereof which comprises:

(I) providing a solution comprising

(a) an organic solvent

(b) a halogenated aromatic bisphenol, and

(c) an acid acceptor;

(II) adding said diacid halide to the solution of I under conditions sufficient to react said diacid halide with the halogenated aromatic bisphenol of I to form a polymer;

(III) sensing the viscosity of the solution containing the resulting polymer; and

(IV) terminating the addition of the diacid halide in response to the sensing of a predetermined solution viscosity limit.

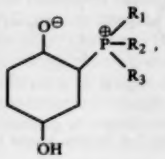
4,132,706

LATENT CATALYSTS FOR PROMOTING REACTION OF EPOXIDES WITH PHENOLS AND/OR CARBOXYLIC ACIDS

George A. Doorakian, Waltham, and Lawrence G. Duquette, Maynard, both of Mass., assignors to The Dow Chemical Company, Midland, Mich.

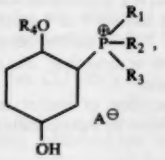
Continuation of Ser. No. 481,599, Jun. 21, 1974, abandoned.
This application Apr. 5, 1976, Ser. No. 674,019
Int. Cl.[2] C08L *63/00*
U.S. Cl. 528—89 **25 Claims**

1. A precatalyzed epoxy resin composition comprising (a) an epoxy resin bearing an average of more than one vicinal epoxy group per molecule and (b) a small but catalytic amount of a trisubstituted (2,5-dihydroxyphenyl)phosphonium hydroxide inner salt corresponding to formula I



I

wherein R_1–R_3 are hydrocarbyl or inertly-substituted hydrocarbyl radicals, each of which independently has from 1 to about 20 carbon atoms; or a hydrolyzed derivative of I corresponding to formula II



II

wherein R_1–R_3 have the aforesaid values, R_4 is hydrogen, benzyl or lower alkyl, and $A^{\ominus}$ is a compatible neutralizing anion.

4,132,707

PREPARATION OF BRANCHED POLY(ALKYLENE TEREPHTHALATES)

Willem F. H. Borman, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 6, 1976, Ser. No. 747,637
Int. Cl.[2] C08G *63/26, 63/70*
U.S. Cl. 528—273 **14 Claims**

1. A method for the preparation of a high molecular weight copolyester consisting essentially of a poly(alkylene terephthalate) or a mixed poly(alkylene terephthalate) and from 0.01 to 3 mole percent, based on the terephthalate units, of units of a branching component which contains at least three ester-forming groups, said polyester or mixed polyester having an intrinsic viscosity of greater than about 1.1 dl./g., as measured as a solution in a 60:40 mixture of phenol and tetrachloroethane at 30° C., said process comprising:

(a) intimately blending a normally solid linear poly(alkylene terephthalate) or mixed poly(alkylene terephthalate) having an intrinsic viscosity of below about 1.05 dl./g., measured as a solution in a 60:40 mixture of phenol and tetrachloroethane at 30° C., with said branching component and transforming the intimate blend into a solid particulate state; and

(b) heating the particles of solid polyester-branching component blend at a temperature of above 150° C. and below the melting point of said particles in the presence of an inert gas until the desired degree of increase in intrinsic viscosity is obtained.

4,132,708

METAL COMPLEXES OF AZOMETHINES AND PROCESS FOR THEIR MANUFACTURE

Francois L'Eplattenier, Therwil; André Pugin, and Jost von der Crone, both of Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

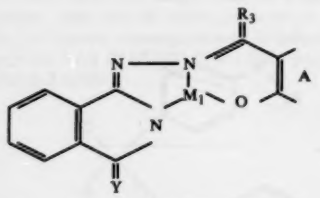
Division of Ser. No. 545,457, Jan. 30, 1975, Pat. No. 4,022,770. This application Mar. 3, 1977, Ser. No. 773,990

Claims priority, application Switzerland, Feb. 6, 1974, 1625/74

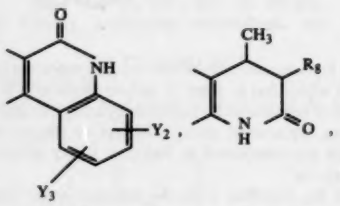
Int. Cl.[2] C07D *401/12, 403/14, 403/12;* D06P *1/10*

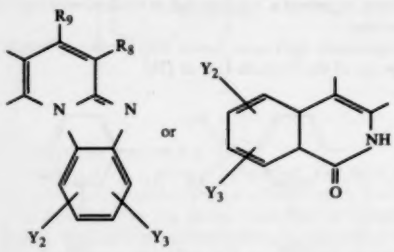
U.S. Cl. 546—7 3 Claims

1. An azomethine metal complex of the formula

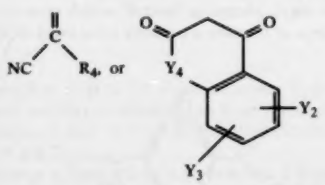


wherein R_3 is alkyl of 1–4 carbon atoms, M_1 is Ni, Cu, Co or Zn, A is a radical of the formulae

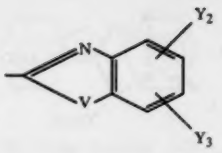




wherein R_8 is cyano, or carbamoyl, R_9 is hydrogen, or hydroxy, Y_2 and Y_3 are hydrogen, halogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, or nitro, Y is a group of the formulae



wherein Y_2 and Y_3 have the above-indicated meanings, Y_4 is oxygen, sulfur, or NH, R_4 of cyano, alkoxycarbonyl, carbamoyl, sulphamoyl, or a radical of the formula



in which V is oxygen, sulfur, or imino, Y_2 and Y_3 have the meaning indicated above.

4,132,709

[2]BENZOPYRANO[4,3-c]PYRIDINE DERIVATIVES AND PROCESS THEREFOR

George Santroch, Montreal, and Leslie G. Humber, Dollard des Ormeaux, both of Canada, assignors to Ayerst, McKenna & Harrison, Ltd., Montreal, Canada

Filed Dec. 20, 1976, Ser. No. 752,656

Int. Cl.[2] C07D *491/04*

U.S. Cl. 546—89 24 Claims

1. (4a,10b-trans)-2,3,4,4a,6,10b-Hexahydro-2,6,6-trimethyl-1H-[2]benzopyrano[4,3-c]pyridine.

4,132,710

[2]BENZOPYRANO[3,4-c]PYRIDINES AND PROCESS THEREFOR

Jean A. Gauthier, Montreal; Leslie G. Humber, Dollard des Ormeaux, and Clara Revesz, Montreal, all of Canada, assignors to Ayerst, McKenna and Harrison, Ltd., Montreal, Canada

Filed Dec. 20, 1976, Ser. No. 752,654

Int. Cl.[2] C07D *491/04*

U.S. Cl. 546—63 21 Claims

1. [4a,10b-cis]-2,3,4,4a,6,10b-Hexahydro-3,6,6-trimethyl-1H-[2]benzopyrano[3,4-c]pyridine.

4,132,711

PROCESS FOR PREPARING NITRILES

Richard V. Norton, Wilmington, Del., assignor to Suntech, Inc., Wayne, Pa.

Filed Feb. 28, 1977, Ser. No. 772,415

Int. Cl.[2] C07C *120/00;* C07D *213/84*

U.S. Cl. 546—286 8 Claims

1. A process for the preparation of aliphatic or aromatic nitriles which comprises reacting an organic carboxylic acid of the formula R-COOH where R is an aliphatic or aromatic group with an aromatic o-dinitrile of the formula $Ar(CN)_2$ where Ar is an aromatic group of the benzene and naphthalene series at a temperature of from about 100° to about 300° C. whereby the nitrile of the acid is obtained with cyclic imide by-product, and imide by-product is converted to dinitrile by ammonolysis and said dinitrile is recycled.

4,132,712

ANTIBACTERIAL AGENTS

Thomas T. Howarth, Ewhurst; Irene Stirling, Worcester Park, and David F. Corbett, Reigate, all of England, assignors to Beecham Group Limited, England

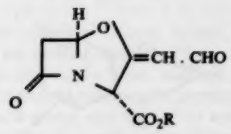
Filed Aug. 26, 1976, Ser. No. 717,900

Claims priority, application United Kingdom, Oct. 13, 1975, 41889/75

Int. Cl.[2] C07D *498/04*

U.S. Cl. 260—307 FA 4 Claims

1. A mixture of the E- and Z-isomers of a compound of the formula (II):



wherein CO_2R is an ester group wherein R is methyl, ethyl, phenyl, benzyl, acetoxymethyl, pivaloyloxymethyl, phthalidyl, benzhydryl, methoxybenzyl, dimethoxybenzhydryl, allyl or acetonyl.

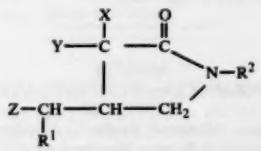
4,132,713

PROCESS FOR THE PREPARATION OF N-SUBSTITUTED HALOPYRROLIDONES

Michael D. Broadhurst, El Cerrito, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 23, 1977, Ser. No. 864,021
Int. Cl.[2] C07D 207/26
U.S. Cl. 260—326.5 FL **17 Claims**

1. A process for the preparation of a compound having the formula



in which

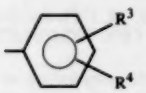
X is selected from the group consisting of hydrogen, chlorine, and methyl;

Y is selected from the group consisting of hydrogen, chlorine, and bromine;

Z is selected from the group consisting of chlorine and bromine;

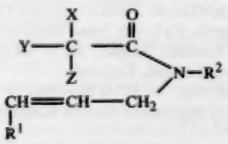
R^1 is selected from the group consisting of hydrogen and C_1–C_4 alkyl; and

R^2 is selected from the group consisting of C_1–C_6 alkyl, C_3–C_6 alkenyl, C_1–C_6 haloalkyl, C_3–C_7 cycloalkyl, C_4–C_8 cycloalkylalkyl, benzyl, chlorobenzyl, and



in which R^3 is selected from the group consisting of hydrogen, C_1–C_4 alkyl, acetyl, chlorine, bromine, fluorine, iodine, trifluoromethyl, nitro, cyano, C_1–C_4 alkoxy, C_1–C_4 alkylthio, C_1–C_4 alkylsulfinyl, C_1–C_4 alkylsulfonyl, trifluoromethylthio, trifluoromethylsulfinyl, trifluromethylsulfonyl, pentafluoropropionamido, and 3-methylureiodo; and R^4 is selected from the group consisting of hydrogen, C_1–C_4 alkyl, chlorine, and trifluoromethyl;

which comprises heating an α-halogen-containing N-2-alkenyl amide of the formula



in which X, Y, Z, R^1, and R^2 are as defined above, to a temperature of from about 60° C. to about 200° C., in the presence of a catalytic amount of a transition-metal-containing catalyst in which the transition metal is selected from the group consisting of vanadium, molybdenum, ruthenium, silver, and copper.

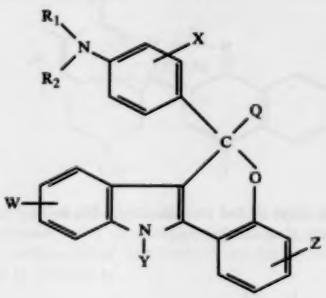
4,132,714

PRODUCTION OF CHROMENOINDOLE COMPOUNDS

Jean C. Petitpierre, Kaiseraugst, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 20, 1977, Ser. No. 799,062
Claims priority, application Switzerland, Feb. 25, 1977, 2395/77
Int. Cl.[2] C07D 209/80
U.S. Cl. 260—326.5 B **10 Claims**

1. A process for the manufacture of a chromenoindole compound of the formula



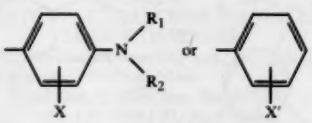
(I)

wherein

R_1 and R_2 independently of one another represent hydrogen, alkyl which has at most 12 carbon atoms and is unsubstituted or substituted by halogen, nydroxyl, cyano or lower alkoxy, cycloalkyl, phenyl, benzyl or phenyl or benzyl which are substituted by halogen, lower alkyl or lower alkoxy, or

R_1 and R_2, together with the nitrogen atom which links them, represent a 5-membered or 6-membered heterocylic radical,

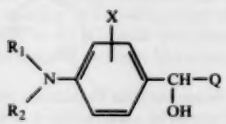
Q represents hydrogen, lower alkyl, phenyl, benzyl or a group of the formula (1a) or (1b)



(1a) (1b)

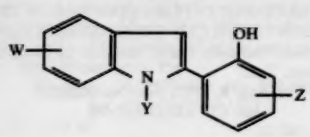
X and X′ each represent hydrogen, halogen, lower alkyl or lower alkoxy,

Y represents hydrogen, alkyl of 1 to 12 carbon atoms, phenyl or benzyl and W and Z independently of one another are hydrogen, halogen, nitro, lower alkyl, lower alkoxy, phenyl, phenoxy, amino or amino which is substituted by lower alkyl, phenyl or benzyl, which process comprises the steps of reacting a carbinol compound of the formula



(2)

with a (2-(2′-hydroxyphenyl)-indole compound of the formula



(3)

in the presence of an acid catalyst selected from the group consisting of lower aliphatic carboxylic acids or inorganic acids at a temperature from 20 to 100° C for a period of time from 0.5 hour to 15 hours and oxidising the reaction product with an oxidising agent selected from the group consisting of chromates, bichromates, chlorates, chlorites, peroxides, manganese dioxide, lead dioxide, chlorine, bromine, molecular oxygen, air, perborates, permanganates or hydrogen peroxide, at a temperature from 20 to 100° C and for a period of time from 1 hour to 5 hours.

4,132,715

PROCESS FOR THE PRODUCTION OF MALEIMIDES

Martin Roth, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

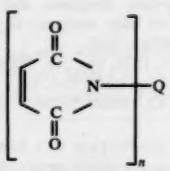
Filed Mar. 30, 1977, Ser. No. 782,682

Claims priority, application Switzerland, Apr. 9, 1976, 4534/76

Int. Cl.[2] **C07D** *207/44*

U.S. Cl. 260—326.26 **11 Claims**

1. Process for the production of an imide of the formula I

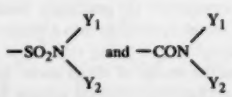


(I)

wherein

n represents the number 1 or 2,

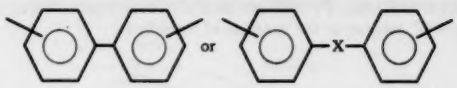
Q represents, if n is 1, phenyl, 1-naphthyl, 2-naphtyl, or said phenyl or said naphthyl groups substituted by 1 to 3 moieties selected from the group consisting of halogen, hydroxyl, alkyl of 1 to 8 carbon atoms, halogenoalkyl of 1 to 3 carbon atoms, alkylthio of 1 to 4 carbon atoms, N,N-dialkylamino of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, phenoxy, alkoxycarbonyl of 2 to 5 carbon atoms; $-SO_2Y$, —NHCOY,



where

Y is phenyl or alkyl of 1 to 4 carbon atoms, Y_1 is hydrogen, phenyl, naphthyl or alkyl of 1 to 8 carbon atoms and Y_2 is hydrogen or alkyl of 1 to 8 carbon atoms; cyano and nitro; and, if n is 2,

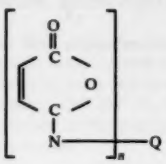
Q represents 1,3-phenylene, 1,4-phenylene 1,2-naphthylene, 1,8-naphthylene or 2,3-naphthylene; or said phenylene or naphthylene substituted by 1 to 3 moieties selected from the group given for substituting phenyl or naphthyl for Q when n is 1; or a group of the formulae



whereby

X represents the bridge member —O—, —S—, —S-S—, $-SO_2-$, $-CH_2-$, —CO— or

which process comprises converting an isoimide of the formula II

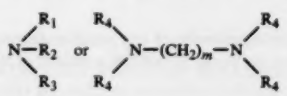


(II),

wherein Q and n have the meanings given under the formula I, in the presence of a compound of the formula III

$$M-(OH)_z \qquad \text{(III)}$$

and of a teriary amine of the formula IV or V



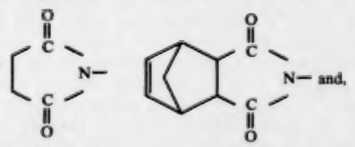
(IV) (V)

wherein

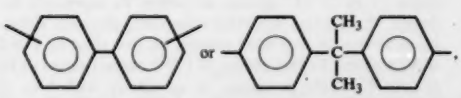
z represents the number 1 or 2,

m represents an integer from 2 to 6,

M represents, where z is 1, phenyl, naphthyl or said phenyl substituted by 1 to 3 moieties selected from the group consisting of nitro, hydroxyl, alkyl of 1 to 4 carbon atoms and halogen, or a group



where z is 2, a group



R_1 and R_2 independently of one another represent an alkyl group having 1 to 16 carbon atoms, a cycloalkyl group having 3 to 12 carbon atoms, or benzyl,

R_3 represents an alkyl group having 1 to 16 carbon atoms, phenyl, benzyl or phenylethyl, and

R_4 represents methyl or ethyl,

at a temperature of about 0–80° C., to an imide of the formula

I, and wherein the compound of formula III and the tertiary amine of formula IV or V are each used in amount of 0.2 to 10 mol %, relative to the isoimide of formula II.

4,132,716

IMIDYL-BENZENE-DICARBOXYLIC AND -TRICARBOXYLIC ACID DERIVATIVES

Vratislav Kvita, Muttenz; Roland Darms, Therwil, and Gerd Greber, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

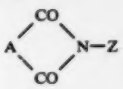
Filed Jun. 15, 1976, Ser. No. 696,348

Claims priority, application Switzerland, Jun. 18, 1975, 7953/75

Int. Cl.[2] C07D *405/02, 207/44*

U.S. Cl. 260—326.34 7 Claims

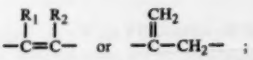
1. An imidyl-benzenetricarboxylic acid compound of the formula I



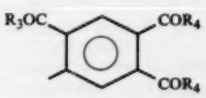
(I)

wherein

A denotes a radical of the formula



R_1 and R_2 independently of one another denote hydrogen, chlorine or bromine; Z denotes a radical of the formula



R_4 denotes hydroxyl, phenoxy, phenoxy substituted by one or two nitro groups, by one alkyl of 1 to 2 carbon atoms, by one alkoxy of 1 to 2 carbon atoms or by two to five halogen atoms, alkoxy with 1 to 18 carbon atoms or an $-O^-M^+$ group, in which M^+ represents an alkali metal cation, a trialkylammonium cation with 3 to 24 carbon atoms or a lower alkyl quaternary ammonium cation; or the two R_4 groups conjointly denote the —O— grouping; and when R_4 represents phenoxy, substituted phenoxy or alkoxy, or two R_4 groups conjointly denote —O—, R_3 denotes chlorine, hydroxyl, phenoxy, phenoxy substituted by one or two nitro groups, by one alkyl of 1 to 2 carbon atoms, by one alkoxy of 1 to 2 carbon atoms or by two to five halogen atoms, alkoxy with 1 to 18 carbon atoms or an O^-M^+ group; and when R_4 represents hydroxyl, R_3 denotes hydroxyl, phenoxy, phenoxy substituted by one or two nitro groups, by one alkyl of 1 to 2 carbon atoms, by one alkoxy of 1 to 2 carbon atoms or by two to five halogen atoms, or an alkoxy with 1 to 18 carbon atoms and, when R_4 represents an $-O^-M^+$ group, R_3 denotes an $-O^-M^+$ group, phenoxy, phenoxy substituted by one or two nitro groups, by one alkyl of 1 to 2 carbon atoms, by one alkoxy of 1 to 2 carbon atoms or by two to five halogen atoms; or alkoxy with 1 to 18 carbon atoms; and M^+ denotes an alkali metal cation, a trialkylammonium cation with 3 to 24 carbon atoms or a lower alkyl quaternary ammonium cation.

4,132,717

ENOL LACTONE INTERMEDIATE FOR THE PREPARATION OF (1R,CIS)-CARONALDEHYDIC ACID

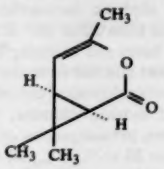
Steven A. Roman, Oakdale, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 9, 1977, Ser. No. 823,233

Int. Cl.[2] C07D *311/94*

U.S. Cl. 260—343.21 1 Claim

1. A compound of the formula



in the 1R,cis form.

4,132,718

PREPARATION OF LIQUID EPOXY RESINS FROM BISPHENOLS

Silvio Vargiu, Casatenovo (Como); Mario Pitzalis, Arcore (Milan); Giancarlo Crespolini, Bergamo, and Gino Giuliani, Parabiago (Milan), all of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

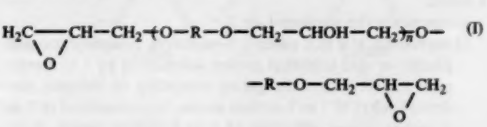
Filed Dec. 7, 1976, Ser. No. 748,345

Claims priority, application Italy, Dec. 19, 1975, 30496 A/75

Int. Cl.[2] C08G *59/06*

U.S. Cl. 260—348.15 13 Claims

1. A method for the preparation of a low viscosity, low hydrolyzable chlorine content liquid epoxy resin corresponding to the general formula:



(I)

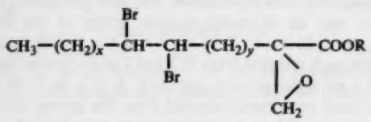
wherein R is the bisphenyl radical of bisphenol-A and n has an average value of from 0 to about 0.07 by reaction of epichlorohydrin with bisphenol-A in the presence of an alkali metal hydroxide, with comprises: (a) gradually feeding an aqueous solution of alkali metal hydroxide into a mixture of epichlorohydrin and bisphenol-A in a molar ratio of at least 10:1, until the ratio between the moles of alkali metal hydroxide fed in and the number of phenolic hydroxyl groups in said mixture is from 1:1 to 1.05:1, while maintaining the reaction medium at boiling point, distilling off water in the form of an azeotropic mixture with epichlorohydrin and recycling the distilled epichlorohydrin into the reaction medium, the addition of alkali metal hydroxide and the distillation conditions being so adjusted as to maintain in the reaction medium a content of liquid water of from 0.1 to 0.7 wt.% and a pH value between 7 and 9, wherein the reaction medium is boiled at a temperature of from 70° to 90° C. and at a pressure of from 150 to 350 mm Hg; and (b) recovering the liquid epoxy resin from the reaction products.

4,132,719
DIBROMOALKYLGLYCIDIC ACID DERIVATIVES

Richard J. Mohrbacher, Maple Glen; Winston Ho, Hatfield, and Gene F. Tutwiler, Churchville, all of Pa., assignors to McNeilab Inc., Fort Washington, Pa.

Filed Apr. 20, 1978, Ser. No. 897,971
Int. Cl.[2] C07D 303/42
U.S. Cl. 260—348.48 4 Claims

1. A dibromoalkylglycidic acid derivative having the formula:



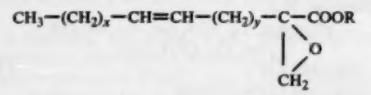
wherein x and y are each a positive integer the sum of which (x+y) equals an integer from 8 to 13, and R is a member selected from the group consisting of hydrogen and loweralkyl.

4,132,720
ALKENYLGLYCIDIC ACID DERIVATIVES

Richard J. Mohrbacher, Maple Glen; Winston Ho, Hatfield, and Gene F. Tutwiler, Churchville, all of Pa., assignors to McNeil Laboratories, Inc., Fort Washington, Pa.

Filed Apr. 20, 1978, Ser. No. 897,972
Int. Cl.[2] C07D 303/42
U.S. Cl. 260—348.61 4 Claims

1. An alkenylglycidic acid derivative having the formula:



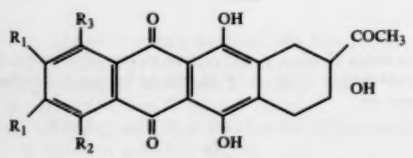
wherein x and y are each a positive integer the sum of which (x+y) equals an integer from 8 to 13, and R is a member selected from the group consisting of hydrogen and loweralkyl.

4,132,721
OPTICALLY ACTIVE ANTHRACYCLINONES AND PROCESS THEREFOR

Luigi Bernardi; Pietro Giardino; Bianca Patelli, all of Milan, and Federico Arcamone, Nerviano, Milan, all of Italy, assignors to Societa Farmaceutici Italia S.p.A., Milan, Italy

Filed Jun. 2, 1977, Ser. No. 802,789
Claims priority, application United Kingdom, Jun. 19, 1976, 25517/76
Int. Cl.[2] C07C 49/70
U.S. Cl. 260—365 9 Claims

1. A process for preparing an optically active anthracyclinone of the formula III:



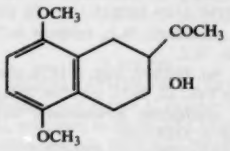
III

wherein:

(a) R_1 is hydrogen and R_2 and R_3 are the same and are both selected from the group consisting of hydrogen, methyl, methoxy, chlorine and bromine;

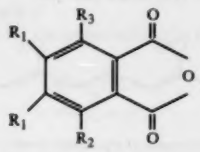
(b) R_2 and R_3 are both hydrogen and R_1 is methyl, methoxy, chlorine or bromine; and

(c) R_1 and R_3 are both hydrogen and R_2 is methoxy, said process comprising melting an optically active (−) 1,4-dimethoxy-6-hydroxy-6-acetyl-tetralin of the formula II:



II

with a phthalic anhydride of the formula IV:



IV

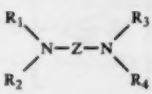
wherein R_1, R_2 and R_3 are as defined above, in the presence of aluminum chloride or bromide and an alkali metal chloride, at a temperature between 130–180° C., for 1 to 10 minutes, to form an anthracyclinone of the formula III, isolating and purifying said anthracyclinone.

4,132,722
OXIDATIVE COUPLING OF ALKYLPHENOLS CATALYZED BY METAL COMPLEXES OF DIIMINO ACID

Thomas F. Rutledge, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Filed Nov. 26, 1976, Ser. No. 745,206
Int. Cl.[2] C07C 37/00, 39/12, 39/16, 45/16
U.S. Cl. 260—396 N 9 Claims

1. A method of preparing a carbon-carbon coupled condensation product of an "alkylphenol," an "alkoxy phenol" or a "1-naphthol," by an oxidative coupling reaction said method comprising contacting an aqueous mixture of the phenol or naphthol with oxygen or oxygen containing gas in the presence of a sufficient amount of alkaline material to sustain pH in the range of about 8.5–9.5 during the oxidative coupling reaction and a catalyst system comprising a diimino acid metal complex wherein the metal is selected from class consisting of divalent copper, divalent nickel, divalent cobalt, divalent manganese, trivalent cerium, trivalent chromium and trivalent iron and wherein the diimino acid has the structural formula



where R_1, R_2, R_3 and R_4 independently are hydrogen, alkyl, hydroxy alkyl or $-(CH_2)_nCO_2H$ where n is 1 or 2, provided that among R_1, R_2, R_3 and R_4 at least two are $-(CH_2)_nCO_2H$; and wherein Z is selected from the class consisting of a C_2–C_8 alkylene group, a hydroxy substituted C_2–C_8 alkylene group a C_2–C_8 oxaalkylene group, a hydroxy substituted C_2–C_8 oxaalkylene group and a cycloaliphatic group, a hydroxy substituted cycloaliphatic group.

4,132,723

SUBSTITUTED PHENYL- OR CYCLOHEX-1-EN-1-yl-3,7-DEMETHYL-NONA-2,4,6-TRIENOIC ACIDS AND DERIVATIVES THEREOF

Beverly A. Pawson, Montclair, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

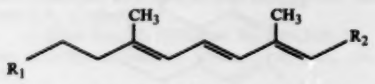
Continuation of Ser. No. 495,482, Aug. 7, 1974, abandoned. This application Feb. 23, 1977, Ser. No. 771,273

Claims priority, application Switzerland, Jul. 16, 1974, 9704/74; Aug. 24, 1973, 12197/73

Int. Cl.[2] C09F 5/00; C11C 3/00

U.S. Cl. 260—404 **5 Claims**

1. A compound selected from compounds represented by the formula



wherein R_1 is a 2,6,6-trimethyl-cyclohex-1-en-1-yl group or a phenyl group substituted in positions 2 and 6 by a member selected from the group consisting of halogen, lower alkyl and lower alkoxy and in at least one of positions 3, 4 and 5 by a member selected from the group consisting of halogen, hydroxy, lower alkyl, lower alkenyl, lower alkoxy, lower alkenoxy, lower alkanoyloxy, nitro, amino, mono(lower alkyl)amino, di(lower alkyl)amino, lower alkanoylamido, and a nitrogen-containing heterocyclic group and R_2 is selected from the group consisting of carboxyl and alkoxycarbonyl.

4. A compound in accordance with claim **1** wherein said compound is 3,7-dimethyl-9-(2,6-dimethyl-4-dimethylaminophenyl)-nona-2,4,6-trien-1-oic acid methyl ester.

4,132,724

PREPARATION OF ORGANOALUMINUM COMPOSITIONS

John H. W. Turner, Chapel-en-le-Firth, England, assignor to Manchem Limited, London, England

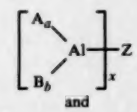
Division of Ser. No. 620,239, Oct. 6, 1975, Pat. No. 4,075,178, which is a continuation-in-part of Ser. No. 345,377, Mar. 27, 1973, abandoned. This application Jun. 30, 1977, Ser. No. 811,644

Claims priority, application United Kingdom, Mar. 28, 1972, 14390/72; Jan. 2, 1973, 170/73

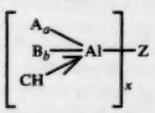
Int. Cl.[2] C07F 5/06

U.S. Cl. 260—448 AD **12 Claims**

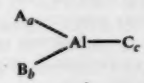
1. The process for preparing a storage-stable fluid, moisture-sensitive compound of a formula selected from the group consisting of



and

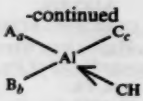


in which a polyfunctional compound of the formula H_xZ is added to an excess of an organoaluminum compound of at least one formula selected from the group consisting of



and

-continued



wherein A, B and C are each selected from the group consisting of alkoxy, aryloxy, alkylcarboxyl, arylcarboxyl, a dicarboxylic acid half ester, a dicarboxylic acid half amide, alkyl sulfate, aryl sulfonate, dialkyl phosphate, alkylaryl phosphate, diarylphosphate, dialkylphosphite, alkylaryl phosphite, diarylphosphite, and an oxymetal organic group of the formula OMA in which M is a divalent metal and A is as defined herein, *a* and *b* are each selected from 0, 1 and 2 and *c* is selected from 1, 2 and 3 with the proviso that $a + b + c = 3$, H_xZ is a polyfunctional compound selected from the group consisting of pigments and fillers containing reactive hydroxyl groups, and *x* is the number of groups capable of reacting with said C.

4,132,725

SUBSTITUTED 3,1-BENZAZASILIN-4-ONES

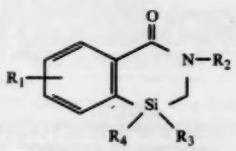
Sandor Barcza, West Orange, N.J., assignor to Sandoz, Inc., East Hanover, N.J.

Filed Feb. 27, 1978, Ser. No. 881,686

Int. Cl.[2] C07F 7/10

U.S. Cl. 260—448.2 N **3 Claims**

1. A compound of the formula

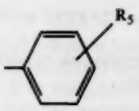


where

R_1 represents H or alkyl of 1–5 carbon atoms,

R_2 represents alkyl of 1–5 carbon atoms,

R_3 represents alkyl of 1–5 carbon atoms or



where

R_5 represents H, alkyl of 1–5 carbon atoms, halo having an atomic weight of about 19–36, alkoxy having 1–5 carbon atoms, or

where

R_6 and R_7 each independently, represent alkyl having 1–2 carbon atoms, and

R_4 represents alkyl having 1–3 carbon atoms.

4,132,726

PROCESS FOR THE PREPARATION OF 4-HYDROXYCYCLOPENT-2-EN-1-ONE DERIVATIVES

Seizi Kurozumi; Takeshi Toru; Toshio Tanaka; Shuzi Miura; Makiko Kobayashi, all of Hino; Sachio Ishimoto, Tokyo, and Sadakazu Matsubara, Hino, all of Japan, assignors to Teijin Limited, Osaka, Japan

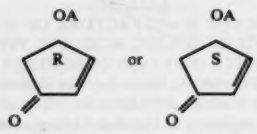
Filed Dec. 22, 1975, Ser. No. 642,800

Claims priority, application Japan, Dec. 27, 1974, 49-149013; Dec. 27, 1974, 49-149014; Mar. 13, 1975, 50-29486; Apr. 17, 1975, 50-45791; Apr. 17, 1975, 50-45792; Apr. 17, 1975, 50-45793

Int. Cl.[2] C07F *7/18*

U.S. Cl. 260—448.8 R 13 Claims

1. An (R)- or (S)-4-hydroxy (or protected hydroxy)cyclopent-2-en-1-one compound represented by the following formula



wherein

A is selected from the group consisting of a hydrogen atom, t-butyldimethylsilyl group, tetrahydropyranyl group and acetyl group.

4,132,727

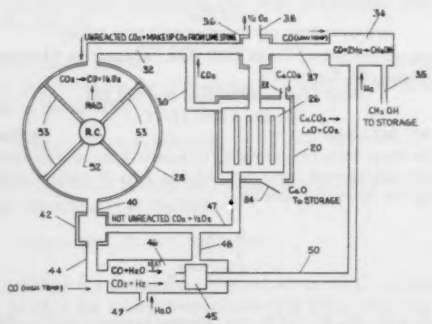
METHOD AND APPARATUS FOR THE MANUFACTURE OF METHANOL

Henry J. Gomberg, Ann Arbor, Mich., assignor to Texas Gas Transmission Corporation, Owensboro, Ky.

Continuation of Ser. No. 478,877, Jun. 7, 1974, abandoned. This application Apr. 8, 1976, Ser. No. 675,137

Int. Cl.[2] B01J *1/10*; C07C *29/16*

U.S. Cl. 260—449.5 5 Claims



1. A method of making methanol which comprises the following simultaneous and continuous steps:

(a) providing an initial source of CO_2;

(b) introducing said CO_2 into a chamber;

(c) subjecting said CO_2 in the chamber to heat and radiation to form hot gases CO and O_2;

(d) utilizing some of said hot gases to heat a carbonate to form CO_2 for introduction into said chamber;

(e) conducting CO gas from said chamber to a first mixing chamber;

(f) introducing H_2O into said mixing chamber to form CO_2 and H_2;

(g) conducting the H_2 to a second mixing chamber; and

(h) conducting a quantity of said hot gases to a separator where CO is separated and directing said CO to said second mixing chamber to form CH_3OH.

4,132,728

PREPARATION OF NITRILES

Pieter A. Verbrugge, and Petrus A. Kramer, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 13, 1977, Ser. No. 806,034

Claims priority, application United Kingdom, Aug. 16, 1976, 33969/76; Aug. 16, 1976, 33970/76

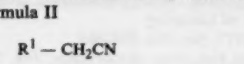
Int. Cl.[2] C07C *121/70*

U.S. Cl. 260—465 G 13 Claims

1. A process for the preparation of a nitrile of formula I

I

wherein R^1 represents a phenyl group optionally substituted by halogen or alkoxy, and R^2 and R^3 are alkyl groups containing from 1 to 6 carbon atoms, which comprises reacting a nitrile of formula II



II

wherein R^1 has the same meaning as in formula I, with a ketone of formula III

III

wherein R^2 and R^3 have the same meaning as in formula I, in the presence of an alkanol and a hydroxide of an alkali metal having an atomic number of at least 11, using a molar ratio or the hydroxide to the compound of formula II in the range of from 0.2 to 0.8.

4,132,729

PURIFICATION OF 2-AMINO-2,4-DIMETHYL-4-METHOXY PENTANENITRILE

Earl P. Moore, Jr., Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 14, 1977, Ser. No. 851,389

Int. Cl.[2] C07C *120/00, 121/43*

U.S. Cl. 260—465.5 R 6 Claims

1. A process for removing water from a solution of water and 2-amino-2,4-dimethyl-4-methoxy pentanenitrile comprising treating said solution of water in 2-amino-2,4-dimethyl-4-methoxy pentanenitrile with sufficient ammonia to form a concentration of ammonia in the water-ammonia composition of at least 18% by weight of ammonia at a temperature of from 0° to 50° C. to form an aqueous layer and a pentanenitrile layer, and separating the pentanenitrile layer and the aqueous layer.

4,132,730

UREYLENE NAPHTHALENE SULFONIC ACIDS

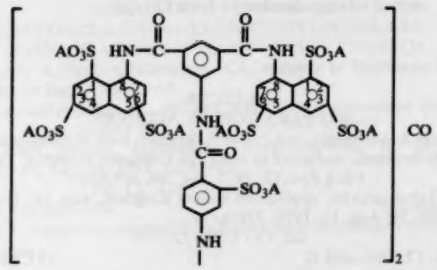
Ransom B. Conrow, Pearl River, and Seymour Bernstein, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jul. 29, 1977, Ser. No. 820,276

Int. Cl.[2] C07C *143/30*; A61K *31/185*

U.S. Cl. 260—506 2 Claims

1. A compound of the formula:



wherein A is a pharmaceutically acceptable salt cation.

4,132,731

NOVEL IODIZED ISOPHTHALAMIC ACID COMPOUNDS

Erich Klieger, and Ulrich Speck, both of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

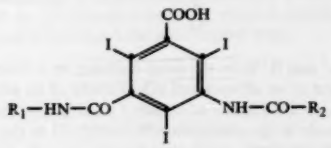
Filed Jun. 14, 1977, Ser. No. 806,383

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1976, 2629228

Int. Cl.[2] C07C *63/12*; A61K *29/02*

U.S. Cl. 424—5 **20 Claims**

1. A compound of the formula



wherein

R_1 is hydroxyalkyl of 2–6 carbon atoms;

R_2 is (a) hydroxymethyl, (b) alkyl of 2–6 carbon atoms, (c) oxaalkyl or dioxaalkyl whose alkyl is of up to 6 carbon atoms, wherein the oxygen atoms in the oxaalkylene or dioxaalkylene are separated from each other and from the ends thereof by at least one methylene, or (d) when R_1 is other than $—CH_2—CH_2—OH$, is methyl; or a salt thereof with a physiologically acceptable base.

4,132,732

PROCESS FOR PREPARING ALPHA-FORMYL ACIDS

Giorgio Bottaccio; Stefano Campolmi, and Maria G. Felicioli, all of Novara, Italy, assignors to Montedison S.p.A., Milan, Italy

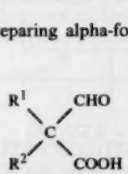
Filed Mar. 2, 1978, Ser. No. 882,867

Claims priority, application Italy, Mar. 3, 1977, 20857 A/77

Int. Cl.[2] C07C *65/02*

U.S. Cl. 562—550 **9 Claims**

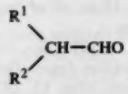
1. A process for preparing alpha-formyl acids having the general formula (I):



in which

R^1 and R^2, which may be the same or different, each represents a hydrogen atom, a linear or branched-chain alkyl containing from 1 to 20 carbon atoms, linear or branched chain alkenyls containing from 2 to 20 carbon atoms, aryl, substituted aryl, a phenoxy group, an acyloxy group or alkoxyl having from 1 to 20 carbon atoms,

which process comprises reacting an aldehyde of the general formula (II):



in which R^1 and R^2 have the same significance as in general formula (I) with CO_2, in the presence of alkaline phenates in a molar ratio of phenate to aldehyde of from about 0.5:1 to about 4:1 and of an aprotic organic solvent, at a temperature of from 0° C. to 80° C., and for from 0.1 to 3 hours.

4,132,733

PROCESS FOR THE MANUFACTURE OF AN ADDITION COMPOUND OF SORBIC ACID AND POTASSIUM SORBATE (POTASSIUM DISORBATE)

Hans Fernholz, Fischbach; Hans-Joachim Schmidt, Falkenstein and Friedrich Wunder, Florsheim am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 10, 1975, Ser. No. 585,603

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1974, 2428411

Int. Cl.[2] C07C *51/52*

U.S. Cl. 562—601 **10 Claims**

1. A process for the preparation of a sorbic acid-potassium sorbate addition-compound having the formula $C_6H_8O_2 \cdot C_6H_7O_2K$ which comprises heating an aqueous solution containing 12 to 40 parts by weight of sorbic acid per 100 parts by weight of an aqueous solution of 40 to 58 weight percent potassium sorbate to a temperature of 45 to 95° C. to produce a warm solution, cooling the solution to room temperature and crystallizing said sorbic acid-potassium sorbate compound from said solution.

4,132,734

SYNTHESIS OF CARBOXYLIC ACIDS

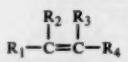
Thomas C. Singleton, Texas City, Tex., assignor to Monsanto Company, St. Louis, Mo.

Filed May 3, 1976, Ser. No. 682,232

Int. Cl.[2] C07C *51/14*

U.S. Cl. 562—522 **7 Claims**

1. In the process of converting to a carboxylic acid an ethylenically unsaturated compound having 2 to 30 carbon atoms having the structural formula



in which R_1, R_2, R_3 and R_4 are moieties having 0 to 20 carbon atoms and are selected from the group consisting of hydrogen and alkyl moieties by reacting in a liquid medium said compound, carbon monoxide and water in contact with a catalyst system consisting essentially of a rhodium or iridium oxide, salt, or carbonyl consisting only of the metal and carbonyl moieties, and a halogen component selected from the group consisting of bromine, iodine, alkyl bromide, alkyl iodide, hydrogen iodide, and hydrogen bromide at a temperature from about 50° to about 300° C. and a carbon monoxide partial pressure in the range from about 1 to about 15,000 psia, the improvement which comprises including in said reaction as an accelerator therefor a metal compound selected from the group consisting of the salts, oxides and hydroxides of cobalt, iron and manganese, the concentration of said metal compound being in the range from about 0.005 to about 0.1 molar and maintaining said water concentration at less than 6 molar.

4,132,735

DETERGENT COMPOSITIONS

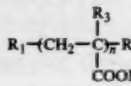
Vincent Lamberti, Upper Saddle River, and Chester R. Willis, Mapleshade, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 591,220, Jun. 27, 1975, Pat. No. 4,095,035, which is a division of Ser. No. 461,060, Apr. 15, 1974, Pat. No. 3,922,230, which is a continuation of Ser. No. 169,101, Aug. 4, 1971, abandoned. This application Feb. 23, 1978, Ser. No. 880,666

Int. Cl.[2] C07C *59/22*

U.S. Cl. 562—582 **1 Claim**

1. An oligomeric polyacrylate having an average molecular weight of greater than 500 and less than about 10,000 and a formula represented by:



wherein n is a whole number integer, R_1, and R_2 are moieties which do not impair biodegradability of the molecule and are selected from the group consisting of hydrogen, alkanols having from one to six carbon atoms, glycols, glycol esters, glycolic acids and salts of glycolic acids, R_3 is selected from the group consisting of hydrogen and alkyl groups having from one to six carbon atoms and M is selected from the group consisting of hydrogen, alkali metals, ammonium and substituted ammonium cations.

4,132,736

PREPARATION OF 4-ALKYLTHIOSEMICARBAZIDES

Gunther Cramm, Cologne; Eckart Kranz, Wuppertal, and Gunter Hellrung, Dormagen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

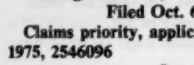
Filed Oct. 6, 1976, Ser. No. 729,933

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1975, 2546096

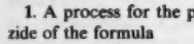
Int. Cl.[2] C07C *159/00*

U.S. Cl. 260—552 SC **10 Claims**

1. A process for the preparation of a 4-alkylthiosemicarbazide of the formula



which comprises heating the hydrazinium salt of a N-alkyldithiocarbamic acid of the formula



in a solvent at a temperature of about 40° to 90° C. sufficiently to produce the 4-alkylthiosemicarbazide while removing by-product H_2S by carrying out the reaction under sub-atmospheric pressure of 100 to 500 mm Hg or by passing an inert gas through the reaction mixture.

4,132,737

TRIFLUOROMETHYL SUBSTITUTED 1-AMINOINDANES

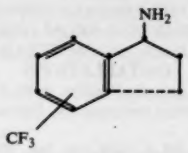
Bryan B. Molloy, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Feb. 27, 1978, Ser. No. 881,301

Int. Cl.[2] C07C *87/64*

U.S. Cl. 260—578 **5 Claims**

1. A compound of the formula



and pharmaceutically-acceptable acid addition salts thereof.

4,132,738

PREPARATION OF 15-DEOXY-16-HYDROXYPROSTAGLANDINS

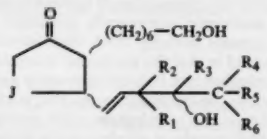
Harold C. Kluender; Warren D. Woessner, and William G. Biddlecom, all of Madison, Wis., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Feb. 23, 1978, Ser. No. 880,501

Int. Cl.[2] C07C *177/00*

U.S. Cl. 260—586 R **28 Claims**

1. A compound having the formula:



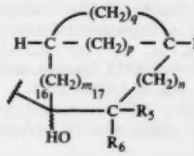
wherein:

J is selected from the group consisting of R-hydroxymethylene and S-hydroxymethylene;

R_1 is hydrogen;

R_2 is hydrogen or together with R_4 is a methylene chain of 2 to 3 carbon atoms such that a cycloalkyl of 5 to 6 carbon atoms inclusive is formed;

R_3 is selected from the group consisting of hydrogen or methyl, or together with R_4 is a methylene or a lower alkylated methylene chain of 2 to 5 carbon atoms such that a cycloalkyl or a lower alkylated cycloalkyl of 4 to 7 carbon atoms inclusive is formed, or together with R_4 is a bicycloalkyl or bicycloalkenyl moiety having the formula:



such that a bicycloalkyl or bicycloalkenyl compound is formed, wherein m and n are integers having a value of from 0 to 3, p is an integer having a value of from 0 to 4 and q is an integer having a value of from 1 to 4 and wherein the double bond of such bicycloalkenyl is in the m, n, p, or q bridge;

R_4 is hydrogen or methyl or together with R_2 or R_3 forms a cycloalkyl or bicycloalkyl or bicycloalkenyl as defined above, or together with R_5 is a methylene chain of 3 to 5 carbon atoms such that a cycloalkyl of 4 to 6 carbon atoms inclusive is formed;

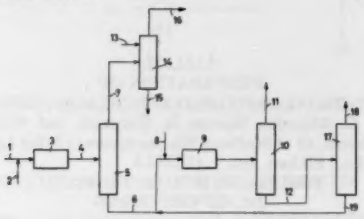
R_5 is selected from the group consisting of hydrogen, straight-chain alkyl having from 1 to 3 carbon atoms or together with R_4 forms a cycloalkyl as defined above; and

R_6 is selected from the group consisting of hydrogen or straight-chain alkyl having from 1 to 3 carbon atoms.

4,132,739
METHOD FOR THE PREPARATION OF CARBONYL PRODUCTS STARTING FROM HYDROCARBON STREAMS COMING FROM STEAM-CRACKING INSTALLATIONS

Carlo Rescalli, and Antonio Pacifico, both of San Donato Milanese (Milan), Italy, assignors to Snama Progetti S.p.A., Milan, Italy

Filed Jul. 6, 1976, Ser. No. 702,584
Claims priority, application Italy, Jul. 8, 1975, 25169 A/75
Int. Cl.² C07C 45/06
U.S. Cl. 260—605 S **7 Claims**



1. A method for the preparation of acetaldehyde and acetone starting from acetylenic compounds contained in the olefin hydrocarbon streams coming from steam-cracking installations, characterized in that the acetylenic compounds are combined with an alcohol in a first reaction zone and in the presence of an acidic ion-exchange resin the acidic centres of which have been entirely exchanged with mercurcy ions and with ions of alkali metals or alkaline earth metals, separating the reaction product by a rectification operation from the remainder of the olefin hydrocarbon stream and subsequently hydrolyzing said product to acetaldehyde and acetone in a second reactor in the presence of an acidic ion-exchange resin, and thereafter separating the carbonyl product thus obtained by a rectification operation, wherein the first reaction zone the temperature is between −20° C and 80° C, the pressure is sufficient to maintain the olefin hydrocarbon stream in a liquid phase and the spatial velocity is between 1 and 50 cc/h.g; and in the second reactor the temperature is between 0° C and 100° C the pressure is sufficient to maintain the reaction mixture in a liquid phase; and the spatial velocity is between 0.5 and 20 cc/h.g.

4,132,740
PREPARATION OF CARBORANYL SULFIDES

Royland D. Shoults, Fayetteville, N.C., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 3, 1972, Ser. No. 293,257
Int. Cl.² C07F 5/02
U.S. Cl. 260—606.5 B **7 Claims**

1. A process for preparation of carboranylmethyl alkyl sulfides comprising:

(a) combining a predetermined amount of decaborane with a predetermined amount of cyclohexane to form a mixture in a suitable reaction container that is provided with means for heating, means for cooling, and means for stirring, said container being equipped with a condenser and means for venting of gaseous reaction products;

(b) stirring said decaborane and cyclohexane until most of the decaborane is dissolved;

(c) adding a predetermined amount, including an excess of the theoretical amount, of a propargyl alkyl sufide to said mixture, said propargyl alkyl sulfide having the formula: $HC{\equiv}CCH_2SR$, where R equals an alkyl group having from 2 to 10 carbon atoms;

(d) refluxing said mixture having said propargyl alkyl sulfide added thereto at a predetermined temperature range and for a predetermined period of time while reacting is accomplished and venting of gaseous reaction products, including hydrogen, is accomplished, said reacting forming a crude reaction product in solution;

(e) cooling said crude reaction product in solution;

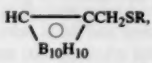
(f) transferring said crude reaction product in solution to a suitable container for separating said crude reaction product;

(g) washing said crude reaction product in solution a plurality of times with a 10% potassium hydroxide solution and followed by washing a plurality of times with a solution selected from water and saline solution to thereby effect separating of said crude reaction product that has been washed;

(h) transferring the separated and washed crude reaction product in solution to a distillation assembly;

(i) distilling the volatile materials, including any excess propargyl alkyl sulfide, until a temperature of about 110° C. is reached, and thereafter, continue distilling the remaining volatiles while gradually reducing the pressure to about 1 mm and while gradually reducing the temperature to about 100° C.; and

(j) separating the reaction product by further distilling at a reduced pressure of about 0.5 mm and at a temperature from about 110° C. to about 160° C., said reaction product being a carboranylmethyl alkyl sulfide having the structure:



where R equals an alkyl group having from 2 to 10 carbon atoms.

4,132,741
PROCESS FOR PRODUCING HALOPRENE

Alfio J. Besozzi, Houston, Tex., assignor to Denka Chemical Corporation, Houston, Tex.

Division of Ser. No. 149,857, Jun. 3, 1971, abandoned, which is a continuation-in-part of Ser. No. 741,225, Jun. 28, 1968, abandoned, which is a continuation-in-part of Ser. No. 494,899, Oct. 4, 1965, abandoned. This application Aug. 21, 1974, Ser. No. 499,187
Int. Cl.² C07C 21/20
U.S. Cl. 260—655 **3 Claims**

1. A process for dehydrohalogenating 1,2-dihalobutene-3 to haloprene at a high rate of conversion comprising contacting said 1,2-dihalobutene-3 with an aqueous caustic solution of 5 to 15 percent by weight of caustic compound in the presence of from 0.09 to 10 weight percent of an anionic surface active agent of a soap of dehydrogenated rosin maintained at a temperature of between 60° C. and 150° C. for a sufficient time to dehydrohalogenate, and removing therefrom haloprene.

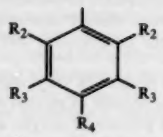
4,132,742
PROCESS FOR MAKING CODIMERS OF NORBORNADIENE AND PHENYLACETYLENES USING A COBALT CATALYST

James E. Lyons, Wallingford; Abraham Schneider, Overbrook Hills, and Harry K. Myers, Jr., Aston, all of Pa., assignors to Suntech, Inc., Wayne, Pa.

Filed Oct. 17, 1977, Ser. No. 842,813
Int. Cl.² C07C 13/28, 18/12
U.S. Cl. 260—668 A **11 Claims**

1. Process for the catalytic codimerization of norbornadiene with a phenylacetylene comprising:

(a) contacting norbornadiene and phenylacetylene group having the following structure: $R\text{-}C{\equiv}CR_1$ wherein R is a hydrogen, phenyl or a phenyl having an alkyl substituent and R_1 is a hydrogen, phenyl or a phenyl having an alkyl substituent wherein the phenyl having alkyl substituents has the following structure:



wherein R_2 is a hydrogen or methyl; R_3 is a hydrogen or C_1–C_5 alkyl; and R_4 is a hydrogen or C_1–C_{10} alkyl, in the presence of a catalytic amount of a homogeneous catalytic system of cobaltic or cobaltous acetylacetonate, 1,2-bisdiphenylphosphino ethane and one of the following alkyl aluminum chlorides: diethyl aluminum chloride, ethyl aluminum dichloride and aluminum ethylsesquichloride;

(b) having the contacting occurring at a temperature within the range from between about 20° C. to about 100° C.; and

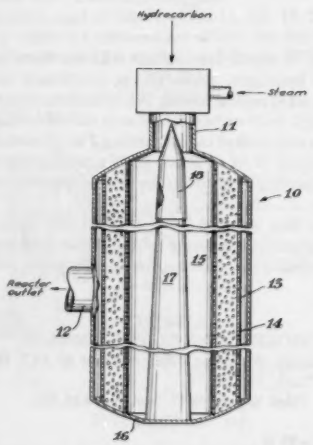
(c) continuing the contacting until the codimer of norbornadiene and the phenylacetylene is prepared.

4,132,743

REDUCTION OF METAL SURFACE-INITIATED CRACKING IN DEHYDROGENATION REACTORS

William M. Castor, Richwood, and Barbara S. Taylor, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 13, 1978, Ser. No. 886,198
Int. Cl.² C07C *15/00*
U.S. Cl. 260—669 R **13 Claims**



1. In the process for catalytically dehydrogenating a hydrocarbon having an alkyl moiety to a corresponding alkenyl compound wherein a gaseous mixture of said hydrocarbon and an inert diluent is fed at an elevated temperature into a void enclosed by metal walls and containing a solid dehydrogenation catalyst and wherein said hydrocarbon undergoes a significant amount of nonselective cracking upon contact with said metal walls at the elevated temperature, the improvement comprising coating at least a portion of said metal walls with a substantially continuous film of a passivating agent selected from the group consisting of Cr_2O_3, V_2O_5, vanadium boride, vanadium metal, TeO_2, ZrO_2, TiO_2, or a mixture thereof, thereby substantially reducing said nonselective cracking.

4,132,744

PROCESS FOR SEPARATING LIQUID OLEFIN-PARAFFIN MIXTURES

John F. Knifton, Austin, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 12, 1977, Ser. No. 859,498
Int. Cl.² C07C *7/16*
U.S. Cl. 260—677 A **10 Claims**

1. A liquid-liquid extraction process for the separation of aliphatic olefins from mixtures of olefinic and paraffinic hydrocarbons, said olefins and paraffins containing from 6 to 20 carbon atoms per molecule, and said process being carried out by:

a. Contacting said mixtures of olefins and paraffinic hydrocarbons from which the olefins are to be separated, with an extractant, non-aqueous solution of Group IB metal salts, said metal salts being selected from the group consisting of silver and copper salts, and said non-aqueous solvent systems being selected from alkanols containing from 1 to 4 carbon atoms, to form a two-phase mixture.

b. Agitating the two-phase mixture to form an extractant phase which is olefin rich and paraffin poor, and a paraffinic phase which is olefin poor,

c. Separating the extractant, olefin-rich, phase from the paraffinic-rich phase and isolating the olefin concentrate contained within the extractant phase.

4,132,745

PROCESS FOR ISOMERIZING 1-BUTENE TO 2-BUTENE

Pierre Amigues, La Muladiere; Jean Gaillard, Carrieres; Jean-Francois Le Page, Rueil Malmaison, and Robert Stern, Paris, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Continuation-in-part of Ser. No. 809,812, Jun. 24, 1977, abandoned. This application Feb. 21, 1978, Ser. No. 879,579
Claims priority, application Belgium, Jun. 25, 1976, 19661
Int. Cl.² C07C *5/24, 5/30*
U.S. Cl. 260—683.2 **19 Claims**

1. In a process for isomerizing 1-butene, wherein a hydrocarbon charge containing 1-butene and hydrogen is contacted with a Group VIII noble metal catalyst, at an isomerization temperature, the improvment wherein the catalyst results from the previous steps of:

(a) passing a gas or a liquid providing a sulfur compound at a concentration of at least 0.1% sulfur b.w. through a bed of catalyst consisting essentially of a Group VIII noble metal at a temperature of 20°–400° C. for a sufficient time to pass therethrough at least 1 gram-atom sulfur per gram-atom of Group VIII noble metal, and then continuing said passing until substantially no more sulfur compound is retained by the catalyst,

(b) contacting the catalyst with substantially sulfur-free hydrogen at a temperature of at least 50° C., thereby obtaining a catalyst of both high activity and selectivity.

4,132,746

SYNTHETIC ELASTOMERIC INSOLUBLE CROSS-LINKED POLYPENTAPEPTIDE

Dan W. Urry, Vestavia Hills, and Kouji Okamoto, Birmingham, both of Ala., assignors to University of Alabama, Birmingham Medical & Education Foundation, Birmingham, Ala.

Filed Jul. 9, 1976, Ser. No. 704,088
Int. Cl.² C08G *69/10*
U.S. Cl. 260—857 TW **18 Claims**

1. A process for preparing a synthetic elastomeric water-insoluble polypentapeptide, comprising cross-linking a first linear polypentapeptide and a second linear polypentapeptide, said first linear polypentapeptide being one consisting essentially of first pentapeptide units ($Val_1Pro_2Gly_3Val_4Gly_5$) and second pentapeptide units in which one of the the amino acid residues of said first pentapeptide unit is replaced by the residue of an amino acid having more than one amino function and

said second linear polypentapeptide being one consisting essentially of first pentapeptide units ($Val_1Pro_2Gly_3Val_4Gly_5$) and second pentapeptide units in which one of the amino acid residues of said first pentapeptide unit is replaced by the residue of an amino acid having more than one carboxyl function, said crosslinking being effected by the presence of an effective amount of an agent which causes reaction between free amino functions of said first linear polypentapeptide and free carboxyl functions of said second linear polypentapeptide.

4,132,747

HEAT-RESISTANT MOLDING RESIN COMPOSITION

Tsutomu Watanabe, Yokohama, and Tetsuo Aso, Tokyo, both of Japan, assignors to Sumitomo Bakelite Company Limited, Tokyo, Japan

Filed Dec. 29, 1975, Ser. No. 645,223
Claims priority, application Japan, Dec. 28, 1974, 49/149224
Int. Cl.[2] C08L *77/06*
U.S. Cl. 260—857 PE **9 Claims**

1. A thermosetting molding resin composition for producing heat-resistant bodies consisting essentially of

100 parts by weight of a polyaminobismaleimide prepolymer which is the reaction product of a bisimide and a diamine;

1 to 100 parts by weight of a modifying reagent selected from the group consisting of (A) diallyl phthalate prepolymers having a weight average molecular weight of 6000–25000 and (B) a mixture of diallyl phthalate prepolymers having a weight average molecular weight of 6000–25000 and at least one monomer having polymerizable double bonds and 2 to 20 carbon atoms, the amount of the diallyl phthalate prepolymers in the mixture being at least 0.5 part by weight per 100 parts by weight of polyaminobismaleimide and the amount of the at least one monomer in the mixture being 0.5 to 50 parts by weight per 100 parts by weight of polyaminobismaleimide, and

0.1 to 10 parts by weight of an organic peroxide.

4,132,748

POLYMERIC FLAME-RETARDANT THERMOPLASTIC RESINS

Ralph P. Arthur, Parkersburg, and Roy M. Turner, Washington, both of W. Va., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Apr. 25, 1977, Ser. No. 790,634
Int. Cl.[2] C08L *55/02, 67/02;* **C09K** *3/28*
U.S. Cl. 260—873 **1 Claim**

1. A flame-retardant composition comprising (1) 100 parts by weight of a graft ABS resin; (2) from about 10.4 to about 26.7 parts by weight of polyethylene tetrabromophthalate; and (3) from about 4.5 to about 7.5 parts by weight of antimony trioxide.

4,132,749

VINYL CHLORIDE SERIES RESIN BLEND COMPOSITIONS

Ichiro Saito, Kobe, and Kazuo Saito, Kyoto, both of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 181,218, Sep. 16, 1971, abandoned, which is a continuation-in-part of Ser. No. 757,133, Sep. 3, 1968, abandoned. This application Jun. 25, 1976, Ser. No. 699,782
Int. Cl.[2] C08L *51/04*
U.S. Cl. 260—876 R **20 Claims**

1. Composition comprising

(A) 90 to 50 parts by weight of vinyl chloride series resin selected from the group consisting of homopolymers of vinyl chloride and copolymers of above 70 percent by weight of vinyl chloride and below 30 percent by weight of other mono olefinic monomers copolymerizable therewith, blended homogeneously with

(B) 10 to 50 parts by weight of graft polymer obtained by polymerizing

(i) 20 to 65 weight percent of butadiene series rubber selected from the group consisting of homopolymers of butadiene and copolymers of butadiene in major proportions and other mono olefinic monomers copolymerizable therewith in minor proportions, said rubber being contained in latex,

(ii) 20 to 50 weight percent of vinyl aromatic hydrocarbon,

(iii) 10 to 50 weight percent of methyl methacrylate,

(iv) 2 to 50 weight percent of acrylic ester but no greater than the combined weight of components (ii), (iii) and (v), and

(v) 0 to less than 10 weight percent of acrylonitrile, said weight percents being based on the combined weight of components (i), (ii), (iii), (iv) and (v).

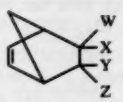
4,132,750

HIGH IMPACT RESIN COMPOSITION

Takashi Ueshima, Yokohama; Toshiro Yokoyama, Kawasaki, and Shoichi Kobayashi, Yokohama, all of Japan, assignors to Showa Denko K.K., Tokyo, Japan

Continuation-in-part of Ser. No. 501,243, Aug. 28, 1974, abandoned. This application Mar. 22, 1977, Ser. No. 780,121
Claims priority, application Japan, Aug. 31, 1973, 48-97233; Dec. 17, 1973, 48-139604
Int. Cl.[2] C08L *87/00, 23/28, 9/00*
U.S. Cl. 260—887 **2 Claims**

1. High impact resin compositions comprising 100 parts by weight of polymer prepared by ring-opening polymerization of at least one kind of cyano-substituted norbornene derivatives and 2 to 25 parts by weight of rubber-like material, said cyano-substituted norbornene derivatives being expressed by the general formula:



where: W, X, Y and Z are radicals selected from the group consisting of hydrogen, nitrile group, substituent containing nitrile group, alkyl radical having 1 to 20 carbon atoms, alkenyl radical having 2 to 20 carbon atoms, aryl radical having 6 to 20 carbon atoms and aralkyl radical having 7 to 20 carbon atoms, at least one of said W, X, Y and Z being a radical selected from the group consisting of nitrile group and substituent containing nitrile group,

said rubber-like material being at least one kind selected from the group consisting of butadiene rubbers, chlorinated polyethylene rubbers, and polyisoprene rubbers.

4,132,751

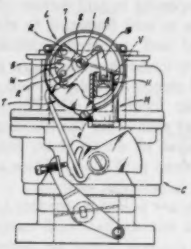
CHOKE VALVE CLOSING MEANS

Jerry H. Winkley, St. Louis, Mo., assignor to ACF Industries, Inc., New York, N.Y.

Filed Sep. 8, 1977, Ser. No. 831,404
Int. Cl.[2] F02M *1/10*
U.S. Cl. 261—39 B **3 Claims**

1. In a carburetor for an internal combustion engine, said carburetor having an air passage through which air is drawn into the engine, an unbalanced choke valve positioned in said air passage and movable between a closed position in which flow of air into said air passage is substantially blocked and a fully open position in which flow of air into said air passage is substantially uninterrupted, said choke valve being mounted on a rotatable shaft having a plate secured to one end thereof, a thermostatic device responsive to the engine temperature for urging said choke valve toward its closed position with a force which diminishes as engine temperature increases, a suction motor adapted to respond to engine vacuum for urging said choke valve toward its fully open position with a force which increases as engine vacuum increases, said thermostatic device

and said suction motor exerting forces on said plate to respectively urge said choke valve toward its closed and fully open position and the position of said choke valve at any time being determined by the net effect of the abovesaid forces, the improvement comprising means for applying a load to said choke valve when it is closed to dampen its movement during cranking of said engine thereby to facilitate starting thereof, said load applying means including a weight having an annular



segmental shape, said weight exerting a force on said plate to force said choke valve closed when its position, as determined by the aforesaid forces, is between its closed position and a predetermined position intermediate said closed and said fully open positions, said weight having a neutral effect on said choke valve when its position is between said predetermined intermediate position and the fully open position thereof, the closing of said choke valve facilitating restarting of said engine when it is shut off.

4,132,752

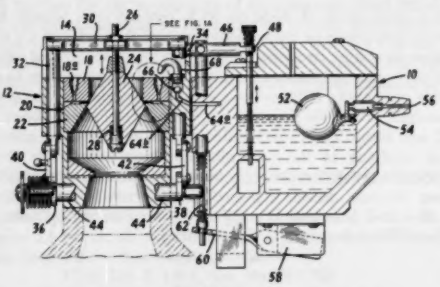
APPARATUS FOR PROVIDING A UNIFORM COMBUSTIBLE AIR-FUEL MIXTURE

Walter E. Petermann, Caracas, Venezuela, assignor to Carbo-Economy, S.A., Caracas, Venezuela

Continuation-in-part of Ser. No. 815,541, Jul. 14, 1977, Pat. No. 4,087,493, which is a continuation of Ser. No. 589,897, Jun. 24, 1975, abandoned. This application Mar. 6, 1978, Ser. No. 884,008

Int. Cl.[2] F02M 9/12

U.S. Cl. 261—40 **9 Claims**



1. A carburetor for internal combustion engines comprising a generally cylindrical housing having an intake air receiving section in the form of an opening of predetermined diameter and length, a mixing chamber in the form of an opening smaller in diameter than the intake air receiving section, and an outlet section, means for supplying liquid fuel to the mixing chamber, fuel atomization and distribution means in said mixing chamber, said means comprising upper and lower ring-shaped sections that define an opening of minimum diameter within the housing, the upper section having formed therethrough a plurality of circumferentially-spaced openings which function as air bleeds and the lower section having (1) an annular outside wall that communicates with the liquid fuel supply means and constitutes a fuel distribution channel, (2) a generally concially shaped interior wall, and (3) an upper wall having formed therein a plurality of fuel supply channels communicating with the fuel distribution channel and corresponding in number to the air bleed openings formed in the upper section and aligned with said openings, and a regulating member mounted for reciprocating movement within at least the mixing chamber, said regulating member having an upper section of generally frusto-conical shape with a concial angle substantially the same as the conical angle of the interior wall of the lower section of the fuel atomization and distribution means and forming therewith a constricted zone wherein atomization of the liquid fuel supplied from the fuel atomization and distribution means to the constricted zone takes place.

4,132,753

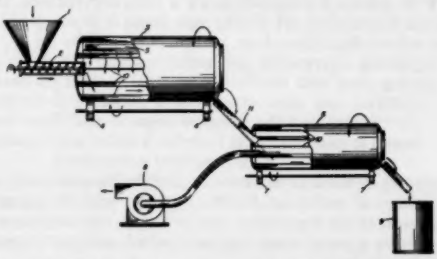
PROCESS OF PREPARING ORAL SUSTAINED RELEASE GRANULES

Mitchell S. Blichare, Blauvelt, and Gerald J. Jackson, Jr., Berdonia, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 432,288, Feb. 12, 1965, abandoned. This application Nov. 3, 1967, Ser. No. 687,070

Int. Cl.[2] B01J 2/12

U.S. Cl. 264—25 **16 Claims**



1. A process of preparing granules of controlled release medicament which comprises: continuously agitating a mixture of (a) powdered medicament and (b) finely divided wax-like material having a melting point between about 30° C and 100° C, while subjecting the mixture to radiation heating at a temperature sufficiently high that the medicament powder has a temperature higher than the melting point of the was-like material, the temperature of the medicament powder also being higher than the actual temperature of the wax-like material, whereby the hotter medicament powder sinks into the molten surfaces of the wax-like material to form granules comprising medicament powder and wax-like material; and cooling, lubricating, and sizing the resulting granules to sizes between about 12 and 60 mesh.

4,132,754

RINSING MULTI COMPONENT FOAM MACHINES

Kurt Weber, Rimbach, Odw., and Michael Brehm, Weinheim, both of Germany, assignors to Firma Carl Freudenberg, Weinheim, Germany

Filed Feb. 11, 1977, Ser. No. 767,923

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1976, 2605984

Int. Cl.[2] B08B 3/08, 9/08

U.S. Cl. 264—39 **5 Claims**

1. The process of rinsing a double component foam machine which comprises contacting the interior parts of said machine with a rinsing agent consisting essentially of an aqueous emulsion of a polyhydric alcohol and a small amount of a saponaceous active oil-in-water emulsifier.

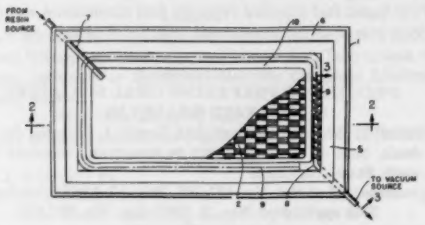
3. The process according to claim 1, wherein prior to and after rinsing a polyurethane foam is produced with the machine by supplying at least two components to the machine, mixing said components, discharging the mixture to form a foaming mass, and subsequently discontinuing supply and discharge.

4,132,755

PROCESS FOR MANUFACTURING RESIN-IMPREGNATED, REINFORCED ARTICLES WITHOUT THE PRESENCE OF RESIN FUMES

Jay Johnson, 3225 N. Verdugo, Glendale, Calif. 91208

Continuation-in-part of Ser. No. 818,068, Jul. 22, 1977, abandoned. This application May 5, 1978, Ser. No. 903,212
Int. Cl.[2] B29J 5/00
U.S. Cl. 264—553 7 Claims



1. A process for manufacturing a resin-impregnated, reinforced article while preventing resin fumes from escaping into the surrounding atmosphere, said process comprising:

depositing a permeable reinforcing material on a mold;

placing over said reinforcing material a sheet of flexible material, said sheet containing a plurality of dispersed perforations and the marginal areas of said sheet being sealed to said mold so as to define a sealed inner chamber in which said reinforcing material is contained;

placing a sheet of impervious flexible material over said sheet of perforated flexible material, with the marginal areas of the impervious sheet sealed to said mold so as to define a sealed outer chamber in which said inner chamber is contained;

effectively connecting said inner chamber to a vacuum source so as to draw the impervious sheet and, along with it the perforated sheet, against said reinforcing material; and

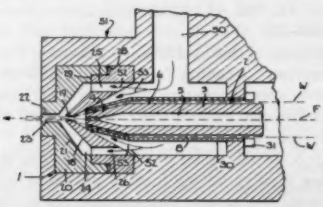
effectively connecting said outer chamber to a source of catalyzed resin so that said resin is passed from said outer chamber into said reinforcing material through the perforations of said first-mentioned sheet, whereby said material is impregnated with resin without the escape of resin fumes into the surrounding atmosphere.

4,132,756

PROCESS FOR EXTRUDING PLASTOMERIC OR ELASTOMERIC MATERIAL ON FILAMENTS

Antonio Ferrentino, Monza (Milan); Antonio Brovedan, Milan, and Angelo Sala, Merate, all of Italy, assignors to Industrie Pirelli, S.p.A., Milan, Italy

Division of Ser. No. 641,980, Dec. 18, 1975, Pat. No. 4,050,867. This application Jun. 29, 1977, Ser. No. 811,402
Claims priority, application Italy, Dec. 20, 1974, 30785 A/74
Int. Cl.[2] B29F 3/10
U.S. Cl. 264—174 4 Claims



1. A process for extruding elastomeric or plastomeric material around at least two filaments having a cross-sectional size of the order of 0.1 millimeters and having a modulus of elasticity of at least 4,000 kilograms per square millimeter with an extrusion head having a mandrel, a die adjacent to and with an opening aligned with an end of said mandrel and a further element on the side of said die opposite from the side thereof adjacent said mandrel and with an opening aligned with the opening in said die, said process comprising:

pulling said filaments from externally of said head to pull them along said mandrel and through the opening in said die and the opening in said further element;

applying forces to said filaments to maintain them against said mandrel and in predetermined spaced positions thereon and to cause them to follow paths on a portion of said mandrel directed axially of said mandrel;

applying further forces to said filaments directed transversely of said paths after the filaments leave said portion of said mandrel to divert them from said paths while maintaining them in spaced relation as they pass through said opening in said die; and

as said filaments are pulled, extruding said material between said filaments intermediate said mandrel and said die and through said opening in said die, and around said filaments with said material therebetween intermediate said die and said further element and through said opening in said further element.

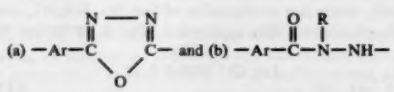
4,132,757

TWIST EFFICIENCY OF OXADIAZOLE/HYDRAZIDE YARN

Andrew I. Smith, and Wen-li Wu, both of Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 27, 1977, Ser. No. 864,190
Int. Cl.[2] D01D 5/06
U.S. Cl. 264—210 F 10 Claims

1. In the wet spinning process for producing yarns of a copolymer consisting essentially of recurring structural units of the formulas:



in a mole ratio of 20:80 to 95:5, respectively, where Ar is meta-phenylene or para-phenylene and R is a C_1 to C_4 alkyl, wherein a dope comprising copolymer in concentrated sulfuric acid is extruded into an aqueous coagulation medium to provide continuous filament yarn of said copolymer which is then washed, dried, hot-drawn at a temperature between about 200° C. and about 500° C. and collected, the improvement comprising applying to the yarn after washing and before drying thereof a finish comprising a stable aqueous emulsion of at least one silicone oil having structural groups of the formula —R—O— where R is a C_2 to C_4 alkylene and at least one dissolved water-soluble zirconium salt.

4,132,758

COPPER LEACHING EMPLOYING NITROGEN DIOXIDE AS OXIDANT

Theodore C. Frankiewicz, Westminster, Calif., and Robert E. Lueders, Needham, Mass., assignors to Kennecott Copper Corporation, New York, N.Y.

Filed Nov. 30, 1977, Ser. No. 855,983
Int. Cl.[2] C01G 3/10, 9/06, 51/10, 53/10
U.S. Cl. 423—27 7 Claims

7. A process for leaching metal values selected from the group consisting of copper, silver, nickel, cobalt, molybdenum, zinc, iron and mixtures thereof from a sulfidic mineral containing said values, said process comprising the steps of:

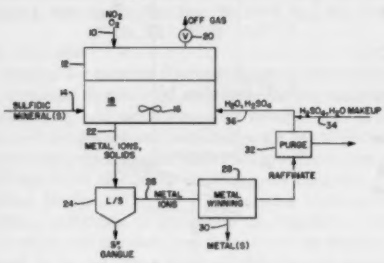
A. providing an aqueous leach liquor comprising sulfuric acid;

B. mixing a particulate, sulfidic mineral containing at least

one of said metal values with the leach liquor to form a slurry;

C. containing said sulfidic mineral with a gas comprising nitrogen dioxide and oxygen in sufficient quantities to provide enough nitrogen dioxide to enable the nitrogen dioxide to be the principal oxidizing agent;

D. agitating the slurry to contact nitrogen dioxide with mineral particles to produce metal values selected from



the group consisting of Cu^{++}, Ag^{++}, Fe^{++}, Fe^{+++}, Ni^{++}, Co^{++}, Mo^{++}, Zn^{++} and mixtures thereof and nitric oxide, said contacting of the mineral particles with nitrogen dioxide, oxidizing the mineral particles and being performed at a temperature below 115° C. and at a pressure between the range of atmospheric pressure and 35 psi; and,

E. allowing the oxygen in said gas to regenerate nitrogen dioxide by oxidizing the nitric oxide produced in step D.

4,132,759

METHOD OF PURIFYING BRINE USED IN ELECTROLYSIS BY THE AMALGAM PROCESS

Rolf Schäfer, Krefeld, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 28, 1978, Ser. No. 881,992

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1977, 2709728

Int. Cl.[2] C01F *11/46*; C01C *5/00*

U.S. Cl. 423—161 **8 Claims**

1. A process for the production of chlorine and alkali metal hydroxide by electrolysis by the amalgam process using calcium- and/or sulphate-containing crude salt, wherein the calcium and sulphate contents introduced into the brine circuit by the crude salt are removed from the brine by precipitation of the double salt $Na_2SO_4 \cdot CaSO_4$.

4,132,760

HEMIHYDRATE TYPE PHOSPHORIC ACID PROCESS USING REDUCED PRESSURE

Fernando Oré, Whittier; John D. Ellis, Upland, and James H. Moore, La Verne, all of Calif., assignors to Occidental Petroleum Corporation, Los Angeles, Calif.

Filed Jul. 7, 1976, Ser. No. 703,208

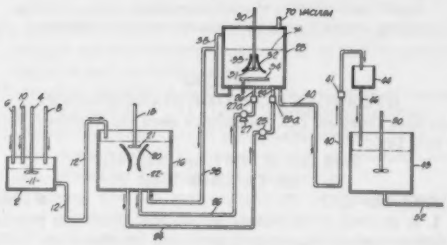
Int. Cl.[2] C01F *1/00, 5/00*; C22B *26/20*; C01B *25/16*

U.S. Cl. 423—167 **9 Claims**

1. A process for the preparation of phosphoric acid from phosphate rock and sulfuric acid comprising the steps of:

(a) adding phosphate rock and phosphoric acid to a first reaction vessel which contains a first slurry comprising calcium sulfate hemihydrate, monocalcium phosphate, and phosphoric acid, whereby the added phosphate rock is substantially converted to monocalcium phosphate, calcium sulfate hemihydrate, and phosphoric acid while maintain the first slurry at a soluble sulfate concentration of about +0.7 to about −4% and at a temperature of about 66% to about 113° C. and and P_2O_5 concentration such that the calcium sulfate by product is the hemihydrate;

(b) adding sulfuric acid in amounts such that the sulfate content of the sulfuric acid plus the sulfate content of the added phospate rock is equivalent to about 90% to about 100% of the stoichiometric amount of sulfate required to react with the calcium present in the phosphate rock added in part (a) to form calcium sulfate hemihydrate to a second reaction vessel maintained at a reduced pressure of about 3 to about 20 inches of mercury absolute and a temperature of about 66°-113° C. which contains a second slurry comprising calcium sulfate hemihydrate, monocalcium phosphate, sulfuric acid and phosphoric acid, whereby the sulfuric acid reacts with the monocalcium phosphate and the phosphate rock to form calcium sulfate hemihydrate and phosphoric acid, said second slurry being maintained at a soluble sulfate concentration of about 0.7% to +4.5 %, provided that the soluble sulfate content of the second slurry is about +1.0% or greater when the soluble sulfate content of the first slurry is about +0.7;



(c) circulating a first portion of the first slurry from the first reaction vessel through a first conduit into the second reaction vessel and circulating a first portion of the second slurry from the second reaction vessel through a second conduit into the first reaction vessel, the circulation being continuous;

(d) circulating a second portion of the first slurry within the first reaction vessel and circulating a second portion of the second slurry within the second reaction vessel, through a draft tube in each case, at a rate at least equal to 50% of the volume of the slurry in the vessel per minute to better mix the slurries in both the first and second reaction vessels; and

(e) separating a third portion of the second slurry into a liquid, comprising phosphoric acid, and a solid comprising calcium sulphate hemihydrate.

4,132,761

GAS-LIQUID CONTACTING

Thomas W. Mix, Wellesley, Mass., assignor to Merix Corporation, Wellesley, Mass.

Continuation-in-part of Ser. No. 689,178, May 24, 1976. This application May 31, 1977, Ser. No. 801,577

The portion of the term of this patent subsequent to Aug. 8, 1995, has been disclaimed.

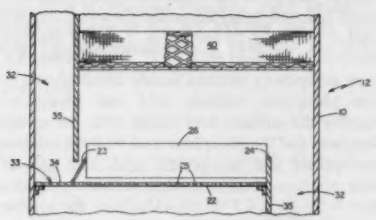
Int. Cl.[2] C01B *17/00*

U.S. Cl. 423—242 **22 Claims**

1. In an SO_2 scrubbing process comprising supplying gas to be scrubbed through an orificed tray in a contacting and separating stage of the cross-flow type having gas and scrubbing liquid inlets thereto, wherein said tray is mounted in effective communication with both said inlets to permit gas to rise through said tray to contact liquid thereabove and produce a two phase dispersion of gas and liquid supported on said tray, that improvement comprising

reducing liquid entrainment by providing a multiplicity of spaced, generally vertical baffles above said tray, said baffles extending generally in the direction of liquid flow across said tray and being sufficiently close together to substantially reduce the amplitude of vertical oscillations

in said dispersion having a wavelength which is small relative to the width of said tray,



reducing the rate of liquid flow along said tray sufficiently to permit carrying out said process without the need for liquid recirculation at said stage, and

carrying out said process without said recirculation.

4,132,762

HYDROGEN PEROXIDE STABILIZATION

Leo Kim, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 31, 1977, Ser. No. 847,272
Int. Cl.[2] C01B *15/02*
U.S. Cl. 423—272 **8 Claims**

1. A method of stabilizing an aqueous hydrogen peroxide solution against decomposition caused by transition metals, said solution having up to about thirty percent by weight of hydrogen peroxide, which comprises adding to the solution more than about 0.001 milliliters of acetonitrile per milliliter of total solution and more than 0.001 milliequivalents of an acid ion exchange resin per milliliter of total solution.

5. A composition comprising an aqueous hydrogen peroxide solution containing up to about thirty percent by weight of hydrogen peroxide and more than 0.001 milliliters of acetonitrile per milliliter of total solution and in contact with more than about 0.001 milliequivalents of an acid ion exchange resin per milliliter of total solution.

4,132,763

PROCESS FOR THE PRODUCTION OF PURE, SILICON ELEMENTAL SEMICONDUCTOR MATERIAL

Dietrich Schmidt, Burghausen; Johann Hofer, Kirchdorf, both of Fed. Rep. of Germany, and Karl E. Huber, Ach, Austria, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

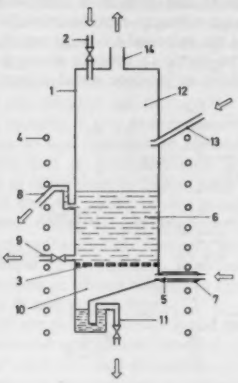
Filed Jun. 29, 1977, Ser. No. 811,029
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1976, 2636348
Int. Cl.[2] C01B *33/02*
U.S. Cl. 423—350 **4 Claims**

1. A process for the production of pure elemental silicon, comprising the steps of:

maintaining a melt of silicon at a temperature at least equal to and up to a maximum of 200° C. above the melting point of silicon on a gas-permeable sieve floor of a reactor;

introducing at least one gaseous, decomposable compound of silicon into said melt under a pressure of about 0.01 to 30 bar by blowing said at least one gaseous, decomposable compound from below and through said sieve floor and into said melt lying above said sieve floor, said pressure under which said at least one gaseous decomposable compound is introduced into the melt being higher than the sum of the hydrostatic pressure of said melt and the gas pressure above said melt and said gaseous decomposable compound being maintained at a temerature below its decomposition temperature prior to its introduction into said melt said decomposable compound decomposing in said melt and forming liquid silicon;

blowing a cooling gas which is inert with respect to said melt into the space above the melt, in order to prevent silicon from depositing outside the melt; and



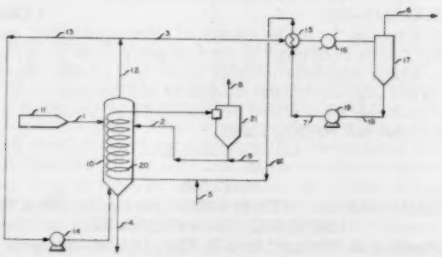
discharging pure elemental silicon in liquid form from said melt.

4,132,764

PRODUCTION OF CARBON MONOXIDE FROM CARBONACEOUS MATERIAL AND ZINC OXIDE

Martin R. Cines, and Forrest L. Poska, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 23, 1976, Ser. No. 716,401
Int. Cl.[2] C01B *31/18*
U.S. Cl. 423—415 A **11 Claims**



1. A process for the production of carbon monoxide which comprises

a. introducing a solid carbon source and zinc oxide into a reactor and forming a reaction mixture in said reactor,

b. reacting zinc oxide and the carbon source at a temperature of 1665° F. to 2800° F. to form a gas comprising carbon monoxide and zinc,

c. withdrawing said gas from said reactor,

d. separating zinc from said gas to form a remaining carbon monoxide-comprising gas, and

e. introducing in the inlet of indirect heat exchange means arranged in said reactor said zinc with an oxidizing agent to form a zinc oxidation mixture and reacting this zinc oxidation mixture to form zinc oxide in an exothermic reaction, thereby passing this zinc oxidation reaction mixture through indirect heat exchange with said reaction mixture in the reactor.

4,132,765

RECOVERY OF FLUORIDE VALUES

Paul C. Yates, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 590,493, Jun. 26, 1975, abandoned, which is a continuation-in-part of Ser. No. 590,492, Jun. 26, 1975, abandoned, which is a continuation-in-part of Ser. No. 238,477, Mar. 27, 1972, abandoned, which is a continuation-in-part of Ser. No. 169,077, Aug. 24, 1971, abandoned. This application Dec. 28, 1976, Ser. No. 755,123

Int. Cl.[2] C01B 7/22

U.S. Cl. 423—484 2 Claims

1. A method for treating fluorapatite ore to recover fluoride values contained therein, said method consisting essentially of

(1) subjecting said ore to aqueous mineral acid attack to convert the phosphate contained in the ore to phosphoric acid in the presence of an added reactive metal compound selected from the group consisting of chloride, nitrate, sulfate, phosphate, bromide, perchlorate, hydroxyacetate, acetate, carbonate or hydroxide of aluminum, titanium, zirconium and trivalent iron, to convert the fluoride contained in the ore into a water-soluble fluoride complex in which a substantial portion remains in solution in the reaction medium and which is sufficiently stable to prevent the formation of fluosilicic acid, said amount of reactive metal compound being present in a molar ratio of reactive metal compound to fluorine content in said ore of from about 1/(V + 3):1 to 2:1, where V is the valence of the reactive metal cation; and

(2) adding sufficient alcohol having from 1 to 4 carbon atoms to obtain a phase separation of the fluoride complex from the phosphoric acid-alcohol solution.

4,132,766

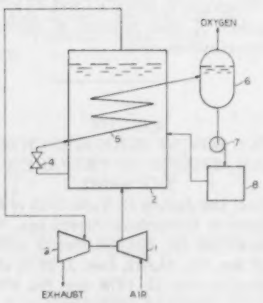
SEPARATION OF OXYGEN FROM GASEOUS MIXTURES WITH MOLTEN ALKALI METAL SALTS

Donald C. Erickson, 1704 S. Harbor La., Annapolis, Md. 21401

Filed May 24, 1977, Ser. No. 799,945

Int. Cl.[2] C01B 13/02

U.S. Cl. 423—579 11 Claims



1. In a continuous process for producing oxygen which comprises the repeated steps of contacting air with an oxygen acceptor which becomes oxidized, separately releasing the oxygen from the oxidized oxygen acceptor so as to regenerate the oxygen acceptor and generate the product oxygen and recycling regenerated oxygen acceptor, the improvement which comprises:

said oxygen acceptor a molten solution comprised of alkali metal nitrite and nitrate salts wherein the ratio of alkali metal nitrate to alkali metal nitrite in the solution is maintained greater than 0.3

4,132,767

PREPARATION OF α-L ANTIBODY, PURIFICATION OF α-L ANTIGEN AND REAGENT FOR DETECTION OF α-L ANTIBODY AND α-L ANTIGEN

Jun-ichi Tohmatsu, Tokyo; Tomiaki Morimoto, Fuchu, and Emiko Kishi, Ohmiya, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Mar. 31, 1977, Ser. No. 783,460

Claims priority, application Japan, Apr. 5, 1976, 51-37928; Apr. 5, 1976, 51-37929; Apr. 5, 1976, 51-37930; Apr. 5, 1976, 51-37931

Int. Cl.[2] A61K 43/00; G01N 33/16

U.S. Cl. 424—1 11 Claims

6. A reagent for detecting α-L antibodies and α-L antigens comprising an α-L antigen having the following properties:

(1) Molecular Weight: About 1,000,000;

(2) Electrophoretic mobility: In the β—α_2 globulin region, which is an intermediate value between that of an HBs antigen and an α-fetoprotein;

(3) Isoelectric point: PI = 5.04, the activity of the α-L antigen was shown in the range of 4.22 to 5.68 by measuring with an Ampholien column;

(4) Bouyant Density: d = 1.08 g/ml in a solution of cesium chloride; and d = 1.03 g/ml in a solution of sucrose;

(5) Formation of complex: A precipitable complex is formed with dextran sulfate in the presence of magnesium chloride, exhibiting lipoprotein-like properties;

(6) Staining: The α-L antigen/antibody precipitated line in agar gel can be stained with Sudan black B;

(7) Thermostability: The antigenic properties in the serum are maintained at a temperature of 56° C. for 30 minutes; and

(8) Form (as an antigen/antibody complex): the spherical particles are about 300 A in diameter.

4,132,768

ULTRAMICRO-QUANTITATIVE DETERMINATION OF ACETONE AND KIT SUITABLE THEREFOR

Michio Ui, and Yukiko Tokumitsu, both of Sapporo, Japan, assignors to Michio Ui, Hokkaido, Japan

Filed Jul. 22, 1977, Ser. No. 818,344

Claims priority, application Japan, Aug. 27, 1976, 51-101632

Int. Cl.[2] G01N 33/16

U.S. Cl. 424—1 18 Claims

1. A process for the ultramicro-quantitative determination of acetone which comprises reacting radioactive molecular or cationic iodine with the acetone contained in a sample from a biological preparation in a strong alkaline solution to quantitatively produce radioactive iodoform according to a haloform reaction, reducing the non-reacted radioactive molecular or cationic iodine to radioactive iodide separating the radioactive iodide from the radioactive iodoform, and measuring the radioactivity of the radioactive iodoform.

4,132,769

CANCER ANTIGEN, CANCER THERAPY, AND CANCER DIAGNOSIS

Kurt B. Osther, Højbjerggårdsvej 22, 2840 Holte, Denmark

Filed Oct. 28, 1975, Ser. No. 625,959

Claims priority, application Denmark, Oct. 30, 1974, 5647/74; Feb. 25, 1975, 708/75; Apr. 11, 1975, 1574/75; Aug. 27, 1975, 3864/75; Jun. 10, 1975, 4503/75

Int. Cl.[2] A61K 29/00, 43/00

U.S. Cl. 424—1 15 Claims

1. Antisera and antibodies with specificity against a human cancer cell associated α-neuramino glycoprotein having inhibitory activity upon C1 esterase hydrolyzing effect, and inhibitory effect on C1 activation of C4 as shown by the inhibition of complement haemolysis.

4,132,770
ORAL PRODUCT
Jordan Barth, East Brunswick, N.J., assignor to Colgate Palmolive Company, New York, N.Y.
Continuation of Ser. No. 701,489, Jun. 30, 1976, abandoned.
This application Dec. 5, 1977, Ser. No. 857,478
Int. Cl.[2] A61K 7/16
U.S. Cl. 424—49 7 Claims

1. A stable mouthwash product having a pH of about 8.0 to about 9.3 and comprising approximately by weight 3 to 9% of sodium bicarbonate, 0.005 to 0.002% of a dye selected from the group consisting of F.D. & C. Blue #1, Red #4, Green #3, Red #40, Yellow #5, D.&C. Red #3, Red #19 and Red #33, 5 to 15% of ethanol or isopropanol, 0.05 to 0.4% of a herbal, medicinal or mint flavor oil, 0.01 to 4.0% of at least one member of the group consisting of nonionic and anionic emulsifiers for the flavor oil, and the balance deionized water, said product being prepared by solubilizing the sodium bicarbonate in deionized water, mixing the resulting solution with a solution of the remaining components in the ethanol or isopropanol, and filtering the sodium bicarbonate solution through a 0.1–1.0 micron filter at least about 12 hours after the formation thereof whereby said product has a bacterial concentration of less than 10 counts/mol.

4,132,771
WARM TWO TONE FLAVORED DENTIFRICE
Ronald S. Schreiber, 96-C Cedar La., Highland Park, N.J. 08904, and Joseph R. Principe, 131-B Taylor Ave., East Brunswick, N.J. 08816
Filed Aug. 24, 1977, Ser. No. 827,295
Int. Cl.[2] A61K 7/16, 7/18
U.S. Cl. 424—52 8 Claims

1. An anhydrous heat releasing fluoride dentifrice which generates heat in the mouth enhancing the fluoride anticaries action and which effects a two tone flavor change in the oral cavity consisting of a finely divided anhydrous synthetic zeolite having an appreciable heat of hydration and capable of being reversibly dehydrated as the sole or major dental polishing agent in amounts of about 10 to 50% by weight which synthetic zeolite is a crystalline metal alumino silicate, said metal being selected from the group consisting of an alkali metal, alkaline earth metal, zinc, copper and mixtures thereof, an effective amount of a fluorine containing compound, about 0.1 to 5% by weight of at least one flavoring agent, and about 20 to 75% by weight of an anhydrous liquid vehicle.

4,132,772
DENTIFRICE
Jordan B. Barth, East Brunswick, and Christopher H. Costello, Millington, both of N.J., assignors to Colgate Palmolive Company, New York, N.Y.
Division of Ser. No. 440,399, Feb. 7, 1974, Pat. No. 3,932,606.
This application Dec. 5, 1975, Ser. No. 638,133
The portion of the term of this patent subsequent to Jan. 13, 1993, has been disclaimed.
Int. Cl.[2] A61K 7/18, 7/22
U.S. Cl. 424—52 25 Claims

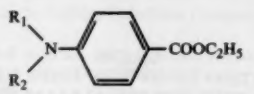
1. A dentifrice having a vehicle and including a surface active agent and/or flavor and containing as sweetener approximately by weight 0.01 to 10.0% of a member selected from the group consisting of 3,4-dihydro-1,2,3-oxathiazin-4-one, the alkaline metal salts and the alkaline earth metal salts thereof.

4,132,773
DENTIFRICES
John S. Best, Camberley; Ronald Hoyles, Epsom Downs; Geoffrey S. Ingram, West Wickham, and Francis B. J. Skinner, Yateley near Camberley, all of England, assignors to Lever Brothers Company, New York, N.Y.
Filed May 18, 1977, Ser. No. 798,094
Claims priority, application United Kingdom, May 19, 1976, 20702/76
Int. Cl.[2] A61K 7/16
U.S. Cl. 424—57 2 Claims

1. An improved dentifrice composition effective against dental caries comprising
(a) from about 0.5 to about 6% by weight of sodium trimetaphosphate as an anti-caries agent; and
(b) from about 0.5 to about 95% by weight of a silica xerogel as an abrasive cleaning agent having an average particle size of about 2 to about 30 microns; the percentages being based on the total weight of the composition.

4,132,774
METHOD OF AND COMPOSITION FOR SCREENING ERYTHEMA INDUCING ULTRAVIOLET BANDS
Albert F. Strobel, Delmar, N.Y., assignor to GAF Corporation, New York, N.Y.
Filed Dec. 6, 1976, Ser. No. 747,598
Int. Cl.[2] A61K 7/44
U.S. Cl. 424—60 15 Claims

1. A sun screening composition comprising an inert carrier having distributed therein an effective sunscreening amount of a mixture of N-monoalkylamino- and N,N-dialkylamino-ethylbenzoates having the structure



wherein R_1 is methyl or ethyl and R_2 is hydrogen, methyl or ethyl, and intermixtures thereof; and wherein the N,N-dialkylamino ethylbenzoate portion of the mixture is between about 25 and 50 weight % where R_1 and R_2 are methyl and between about 50 and 85 weight % when R_1 and R_2 are ethyl and the remaining portion of said mixture is essentially said N-monoalkylamino-ethylbenzoate.

4,132,775
INFECTIOUS BOVINE RHINOTRACHEITIS VIRUS VACCINE AND METHOD OF PREPARING AND USING THE SAME
Frank J. Volenec, and Judson D. Todd, both of Overland Park, Kans., assignors to Richardson-Merrell Inc., Wilton, Conn.
Continuation of Ser. No. 421,438, Dec. 3, 1973, which is a continuation of Ser. No. 94,989, Dec. 3, 1970, abandoned. This application Feb. 13, 1978, Ser. No. 876,998
Int. Cl.[2] A61K 39/12
U.S. Cl. 424—89 5 Claims

1. The non-pathogenic live infectious bovine rhinotracheitis virus vaccine which is effective in protecting bovines against pathogenic strains of infectious bovine rhinotracheitis virus when the bovines are vaccinated by the intranasal route when produced by a method which comprises propagating pathogenic strains of infectious bovine rhinotracheitis virus through at least 41 serial passages of bovine kidney cell cultures followed by at least 23 serial passages in rabbit kidney tissue cultures whereby the pathogenicity of the infectious bovine rhinotracheitis virus is reduced while the ability of the virus to induce the development of protective antibodies is retained.

4,132,776
DELIVERY OF IMMUNOLOGICALLY ACTIVE COMPONENTS OF TRANSFER FACTOR

Wayburn S. Jeter, Tucson, Ariz., assignor to University Patents, Inc., Norwalk, Conn.

Filed Feb. 15, 1978, Ser. No. 877,887
Int. Cl.[2] A61K *35/14, 39/00, 39/04*
U.S. Cl. 424—101 **12 Claims**

1. In the method for enhancing the immunological competance of an animal's response to a selected antigenic substance wherein transfer factor isolated from leucocytes of a donor animal sensitized to said antigenic substance is provided to the circulatory system of an animal in need of such enhancement, an improvement in delivery of an immunologically active component of said transfer factor to the circulatory system of an animal comprising: administering to the alimentary canal of a recipient animal from about 1×10^8 to about 1×10^{10} lymphocyte equivalents of said transfer factor in a pharmaceutically acceptable carrier, whereby said transfer factor is subject to a digestive environment in the recipient animal's digestive tract and the immunologically active component of said transfer factor is absorbed through the digestive tract tissue and transported to the animal's circulatory system.

4,132,777
ANTIFUNGAL COMPOSITIONS AND METHOD

Jan L. van Os, Voorburg; Engbert P. Oldenkamp, Leidschendam, and Dirk A. Smink, Leiderdorp, all of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

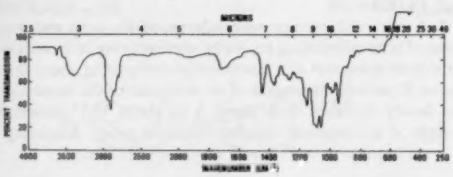
Filed Nov. 24, 1976, Ser. No. 744,513
Claims priority, application United Kingdom, Dec. 1, 1975, 49302/75
Int. Cl.[2] A61K *35/00*
U.S. Cl. 424—119 **13 Claims**

1. An antifungal dry concentrate for the preparation of the composition of claim 4 consisting essentially of natamycin and sufficient amount of citric acid to give a solution of the concentrate a pH value of 2.0 to 4.5.

4,132,778
ANTIBIOTIC A-32887

Robert L. Hamill, Greenwood, and Marvin M. Hoehn, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 801,876, May 31, 1977. This application Oct. 3, 1977, Ser. No. 838,703
Int. Cl.[2] A61K *35/00*
U.S. Cl. 424—121 **5 Claims**



1. A method of increasing feed-utilization efficiency in ruminant animals which comprises orally administering to an animal in need thereof an effective propionate-increasing amount of a compound selected from the group consisting of (1) antibiotic A-32887, which in its free acid form is a white amorphous powder melting at about 90° C. and having the following characteristics:

(a) a molecular weight of about 946, as determined by mass spectrometry;

(b) an approximate empirical formula of $C_{48-49}H_{80-86}O_{17-18}$ and a preferred empirical formula of $C_{48}H_{82}O_{18}$;

(c) an approximate percentage elemental composition of 61.61% carbon, 8.56% hydrogen, and 28.63% oxygen;

(d) an infrared absorption spectrum in chloroform with significant absorption maxima at the following frequencies (cm^{-1}): 3540 (shoulder), 3420 (medium), 2945 (shoulder), 2905 (strong), 2860 (shoulder), 2805 (shoulder), 1710 (weak), 1450 (medium), 1370 (medium), 1350 (shoulder), 1300 (shoulder), 1275 (weak), 1170 (shoulder), 1155 (medium), 1100 (shoulder), 1085 (strong), 1060 (strong), 1010 (weak), 990 (weak), 980 (shoulder), 948 (medium), 890 (weak), and 850 (weak);

(e) no significant absorption in the ultraviolet spectrum;

(f) a proton-magnetic-resonance spectrum which indicates the presence of five methoxyl groups;

(g) a specific rotation as follows: $[\alpha]_D^{25}$ + 15.9° (c 1, $CHCl_3$);

(h) an acid function capable of forming salts and ester derivatives;

(i) at least one hydroxyl group capable of esterification;

and which in its mixed sodium-potassium salt form is a white crystalline compound, when crystallized from acetone-water, having the following characteristics:

(a') a melting point of about 187°–190° C.;

(b') an approximate percentage elemental composition of 60.14% carbon, 8.11% hydrogen, 29.64% oxygen, 2.31% sodium, and 0.46% potassium;

(c') an infrared absorption spectrum in chloroform with significant absorption maxima at the following frequencies (cm^{-1}): 3400 (shoulder), 3210 (medium), 2970 (strong), 2925 (strong), 2870 (weak), 2820 (weak), 1605 (medium), 1455 (medium), 1375 (shoulder), 1358 (medium), 1310 (weak), 1285 (weak), 1183 (medium), 1160 (medium), 1110 (shoulder), 1090 (strong), 1060 (strong), 1012 (weak), 980 (medium), 942 (medium), 910 (weak), 875 (shoulder), and 858 (weak);

(d') an X-ray powder diffraction pattern (CuNi, 1.5405 λ, d=interplanar spacing in angstroms) as follows:

d	Relative Intensity
12.53	50
10.10	100
9.75	40
9.05	40
8.07	70
7.16	100
6.77	100
6.48	70
6.16	60
5.58	50
5.35	50
5.10	30
4.86	60
4.70	50
4.44	50
4.25	50
4.06	40
3.80	30
3.68	40
3.58	30
3.42	60
3.22	10
3.06	10
2.97	10
2.85	10
2.76	02
2.61	15
2.49	05
2.47	05
2.44	15
2.36	10
2.29	10
2.20	02
2.12	02
2.03	05
1.96	05
1.90	02
1.81	02

(e') a specific rotation as follows: $[\alpha]_D^{25}$ + 9.6° (c 1, $CHCl_3$);

(f') a titratable group in 80% aqueous dimethylformamide with a pKa value of 4.60;

(g') solubility in methanol, ethanol, dimethylformamide, dimethyl sulfoxide, ethyl acetate, chloroform, acetone,

and benzene; slight solubility in hexane; and insolubility in water;

(h') stability in aqueous solutions having a pH of from about 3 to about 11, instability in solutions having a pH lower than about 3;

(i') approximate R_f values in the following paper-chromatographic systems using *Bacillus subtilis* ATCC 6633 bioautography for detection:

Solvent System	R_f Value
Water saturated with methyl isobutyl ketone (MIBK)	0.58
Water:methanol:acetone (12:3:1). This solution is adjusted to pH 10.5 with NH_4OH and then lowered to pH 7.5 with H_3PO_4	0.32
Propanol:water (1:9)	0.85
Methanol:propanol:water (6:2:1). Paper buffered with 0.75 M KH_2PO_4, pH 4.0.	0.79
Methanol:0.05 M sodium citrate at pH5.7 (7:3). Paper buffered with 0.05 M sodium citrate at pH 5.7.	0.85
Propanol:water (7:3)	0.91

(j') approximate R_f values in the following thin-layer chromatographic systems, using either vanillin spray reagent or *Bacillus subtilis* bioautography for detection:

Solvent System	R_f Value
Methanol	0.80
Ethyl acetate:ethanol (1:4)	0.65
Ethyl acetate:chloroform (1:1)	0.36
Ethyl acetate:chloroform (6:1)	0.67
Benzene:ethyl acetate:methanol (6:4:0.2)	0.58

and which in its sodium salt form has a molecular weight of about 968 and in its potassium salt form has a molecular weight of about 984, both as determined by FD mass spectrometry; and which in its silver salt form is a crystalline compound (from n-hexane) with a melting point of 166°–168° C.; (2) the acetyl ester derivative of antibiotic A-32887, having an approximate empirical formula of $C_{50-51}H_{82-88}O_{18-19}$, and which in its Na-K salt form has a molecular weight of about 988, a melting point of about 127°–129° C., and an approximate R_f value of 0.40 on silica-gel TLC in benzene:ethyl acetate (1:1), and an infrared absorption spectrum as shown in FIG. 4 of the drawings; (3) the n-butyryl ester derivative of antibiotic A-32887, having an approximate empirical formula of $C_{52-53}H_{86-92}O_{18-19}$, and which in its Na-K salt form has a molecular weight of about 1016, a melting point of about 59°–62° C., an approximate R_f value of 0.64 on silica-gel TLC in benzene:ethyl acetate (1:1), and an infrared absorption spectrum as shown in FIG. 5 of the drawings; and (4) the pharmaceutically-acceptable salts thereof.

4,132,779

ANTIBIOTIC BL580 ZETA AND USE THEREOF AS ANTICOCCIDIAL AGENT

Martin R. Hertz, Pearl River, and John H. E. J. Martin, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jun. 20, 1977, Ser. No. 807,867
Int. Cl.[2] A61K *35/00*
U.S. Cl. 424—122 **7 Claims**

1. Antibiotic BL580 ZETA free acid, a compound which

(a) is effective as an anticoccidial agent; and in its essentially pure crystalline form;

(b) has a melting point of 105°–107° C.;

(c) has the following elemental analysis (percent): C, 63.99; H, 9.43;

(d) has an optical rotation $[\alpha]_D^{20} = 7° \pm 2°$ (C = 0.9 in methanol);

(e) has a characteristic infrared absorption spectrum as shown in FIG. 4 of the drawings.

4,132,780

AZIDE-METAL SALT FORMULATIONS FOR CONTROL OF FUNGI AND NEMATODES

William C. McConnell, Flat Rock, N.C., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 624,357, Oct. 21, 1975, abandoned. This application Aug. 3, 1977, Ser. No. 821,432
Int. Cl.[2] A01N *11/00*
U.S. Cl. 424—127 **72 Claims**

1. A composition suitable for agriculture which is a physical mixture having the property of dissolving in a suitable solvent to form a solution, said composition comprised of granules of an azide and granules of a metal salt; said azide being selected from the group consisting of alkaline earth metal azide, alkali metal azide, and mixtures thereof, and said metal salt being selected from the group consisting of metal salts having a metal ion selected from the group consisting of aluminum, iron (II), cobalt (II), nickel, tin (II), magnesium, zinc, and manganese (II), and an anion selected from the group consisting of bromide, chloride, fluoride, carbonate, hydroxide, phosphate, sulfate, formate, acetate, propionate, butyrate, oxalate, citrate, malate, lactate, and tartrate; the respective amounts of said axide granules and said metal salt granules in the mixture being such that when said mixture is dissolved in said solvent to form the solution, there exists in the solution a ratio of mole equivalents of azide ion to mole equivalents of metal ion within the range of 0.1 to 8.0 and said solution having the property that it is less phytotoxic than a solution having the same amount of azide ion but none of the metal salt therein; and said composition being substantially free from substances which decompose the azide.

4,132,781

METHOD FOR TREATMENT OF ACNE

Richard B. Stoughton, Rancho Santa Fe, Calif., assignor to Nelson Research & Development Company, Irvine, Calif.

Filed Dec. 19, 1974, Ser. No. 534,229
Int. Cl.[2] A61K *31/71*
U.S. Cl. 424—181 **2 Claims**

1. A method for temporarily alleviating the signs and symptoms of acne comprising topically administering to human skin an effective amount of a composition comprising about 0.1 to about 10 percent by weight of an antibiotic of the erythromycin family together with about 5 to about 99.9 percent by weight of a compound selected from the group consisting of 2-pyrrolidone and an N-lower alkyl-2-pyrrolidone.

4,132,782

METHOD FOR SUPPRESSING HERPES SIMPLEX VIRUS

Samuel Bean, 22170 Marlowe, Oak Park, Mich. 48237

Filed May 19, 1977, Ser. No. 798,585
Int. Cl.[2] A61K *35/78*
U.S. Cl. 424—195 **6 Claims**

1. A method for suppressing herpes simplex virus comprising administering topically to a subject infected with said virus, a composition of an extract of mountain ash berries, a dosage effective for the suppression of said virus.

4,132,783

(SUBSTITUTED PYRIDYL)PHENOXY PHOSPHORUS COMPOUNDS AND THEIR USE AS INSECTICIDES

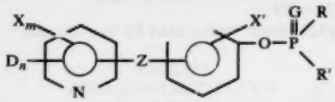
Sudarshan K. Malhotra, Contra Costa, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 746,977, Dec. 2, 1976, Pat. No. 4,080,443, which is a continuation-in-part of Ser. No. 646,808, Jan. 6, 1976, abandoned. This application Nov. 3, 1977, Ser. No. 848,052

Int. Cl.[2] A01N *9/22*; C07D *213/02*

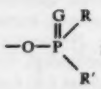
U.S. Cl. 424—200 9 Claims

1. A compound corresponding to the formula



wherein each X independently represents chloro, fluoro or bromo; X′ represents hydrogen, methyl, chloro, bromo or fluoro; G represents oxygen or sulfur; Z represents oxygen, sulfur, sulfinyl or sulfonyl, with the proviso that Z is attached to the pyridine ring in only the 2 or 4 ring position;

D represents the radical



R represents loweralkylthio, loweralkoxy, R′ represents R or phenyl; m represents an integer of from 0 to 4; n represents 0 or 1 and the sum of m + n represents an integer of from 0 to 4.

4,132,784

(SUBSTITUTED PYRIDYL)PHENOXY PHOSPHORUS COMPOUNDS AND THEIR USE AS INSECTICIDES

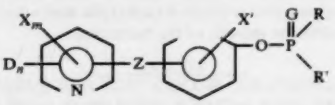
Sudarshan K. Malhotra, Contra Costa, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 746,977, Dec. 2, 1976, Pat. No. 4,080,443, which is a continuation-in-part of Ser. No. 646,808, Jan. 6, 1976, abandoned. This application Nov. 3, 1977, Ser. No. 848,051

Int. Cl.[2] A01N *9/22*; C07D *213/02, 213/57*

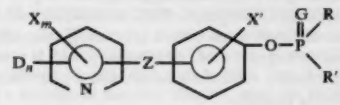
U.S. Cl. 424—200 3 Claims

1. A compound corresponding to the formula



wherein each X independently represents chloro, fluoro or bromo; X′ represents hydrogen, methyl, chloro, bromo or fluoro; G represents oxygen or sulfur; Z represents oxygen, sulfur, sulfinyl or sulfonyl, with the proviso that Z is attached to the pyridine ring in only the 2 or 4 ring position; D represents cyano in the alpha- or 6-position; R represents loweralkylthio, loweralkoxy, loweralkylamino of 1 to 4 carbon atoms or diloweralkylamino of 1 to 4 carbon atoms; R′ represents R or phenyl; m represents an integer of from 0 to 4; n represents 1 and the sum of m + n represents an integer of from 0 to 4.

3. A method for the kill and control of insects which comprises contacting said insects or their habitat with a composition containing as the active ingredient an insecticidally effective amount of a compound corresponding to the formula



wherein each X independently represents chloro, fluoro or bromo; X′ represents hydrogen, methyl, chloro, bromo or fluoro; G represents oxygen or sulfur; Z represents oxygen, sulfur, sulfinyl or sulfonyl, with the proviso that Z is attached to the pyridine ring in only the 2 or 4 ring position; D represents cyano in the alpha- or 6-position; R represents loweralkylthio, loweralkoxy, loweralkylamino of 1 to 4 carbon atoms or diloweralkylamino of 1 to 4 carbon atoms; R′ represents R or phenyl; m represents an integer of from 0 to 4; n represents 1 and the sum of m + n represents an integer of from 0 to 4, in intimate admixture with an inert carrier therefor.

4,132,785

ISOPROPYL PARATHION AS AN INSECTICIDE FOR TREATING SOIL

Daniel Demozay, Lyons, France, assignor to Philagro S.A., Lyons, France

Filed Aug. 11, 1975, Ser. No. 603,270

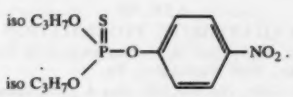
Claims priority, application France, Aug. 14, 1974, 74 28780

Int. Cl.[2] A01N *9/36*

U.S. Cl. 424—218 4 Claims

1. A method of treating soil to destroy soil insects selected from the group consisting of *Musca domestica, Hylemyia brassicae, Chortophila floralis, Psila rosae, Hylenyia antiqua, Hylemyia cilicrura, Phorbia platura, Leptohylemyia coarctata, Oscinella Frit, Hydrelia* spp., *Platyparea poecilopiera, Ophiomyia pinguis,* cecidomyia, trypetida, crane fly, *Bibio hortulanus, agriotes* spp., *Melolontha* spp., *Aphodus, Heteronychus arator, Costelytra realandica,* orycta, *Scutigerella* sp., *Blaniulus* sp. and *Gryllotalpa gryllotalpa* residing in the soil, comprising

applying to the soil an insecticidally effective amount of O,O-diisopropyl-O-p.nitrophenyl thionophospate corresponding to the formula



4,132,786

N-SUBSTITUTED 2-METHOXYBENZENESULPHONAMIDES AND MEDICAMENTS CONTAINING THEM

Robert C. Moreau, Clichy, and Jean-Paul Fournier, Paris, both of France

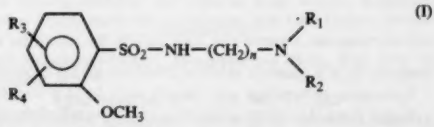
Filed Jun. 8, 1976, Ser. No. 693,896

Claims priority, application France, Jun. 9, 1975, 75 17973

Int. Cl.[2] A61K *31/18, 31/63*; C07C *143/78, 143/72*

U.S. Cl. 424—228 41 Claims

20. A pharmaceutical antiematic, anticonvulsive, local anesthetic or bacteriostatic composition of low toxicity comprising a compound of the formula



(I)

in which

n is 2 or 3,

R_1 and R_2 is a hydrogen atom, methyl or ethyl,

R_3 is a hydrogen atom, an NO_2 group, an NH_2, or halogen, R_4 is a hydrogen, halogen, $—NH_2$, or a sulphonamide group or the addition salts with a physiologically acceptable mineral or organic acid, which compound is present in a therapeutically effective amount, and a pharmaceutically acceptable carrier.

4,132,787

PHARMACEUTICAL COMPOSITIONS CONTAINING A GAMMA-RESORCYLIC ACID DERIVATIVE IN THE TREATMENT OF THROMBOSIS

Gilbert Regnier, Chatenay Malabry; Roger Canevari, Villebon-,Yvette, and Pierre Desnoyers, Fontenay aux Roses, all of France, assignors to Science Union et Cie, France

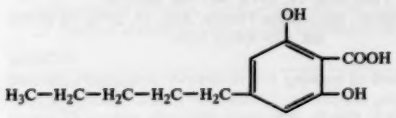
Filed May 21, 1976, Ser. No. 688,533

Claims priority, application United Kingdom, May 30, 1975, 23674/75

Int. Cl.[2] A61K *31/60*

U.S. Cl. 424—230 **7 Claims**

1. A pharmaceutical composition useful for thrombolytic therapy containing as active ingredient, in a thrombolytic amount, a α-resorcylic acid derivative of the formula I:



I

or a physiologically tolerable salt thereof, together with a pharmaceutically acceptable carrier.

4. A method for treating thromboembolic diseases, which comprises administering to an animal an effective thrombolytic dose of 4-n-pentyl-6-hydroxy salicylic acid or a physiologically tolerable salt thereof.

4,132,788

ANTIARTHRITIC POTENTIATION

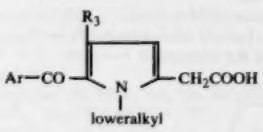
Stewart Wong, Fort Washington, Pa., assignor to McNeil Laboratories, Inc., Fort Washington, Pa.

Continuation of Ser. No. 683,140, May 4, 1976, abandoned. This application Dec. 19, 1977, Ser. No. 862,086

Int. Cl.[2] A61K *31/40, 31/625*

U.S. Cl. 424—232 **21 Claims**

13. A method of inhibiting inflammation and osteogenic degeneration which comprises orally administering to an arthritic patient a pharmaceutical composition sufficient to provide from about 0.001 to 100 mg/kg of body weight of a 5-aroyl-1-loweralkylpyrrole-2-acetic acid compounds as the primary inflammation and osteogenic degeneration inhibiting agent, said compound being a member selected from the group having the formula:



wherein R_3 is a member selected from the group consisting of hydrogen, loweralkyl and chloro, and Ar is a member selected from the group consisting of p-loweralkylphenyl and p-halophenyl, and the non-toxic therapeutically acceptable salts thereof; and from about 50 to 800 mg/kg of body weight of acetaminophen or from about 50 to 300 mg/kg of body weight of aspirin as the potentiating agent.

4,132,789

7-[2-(2-IMINO-4-THIAZOLIN-4-YL)-2-SULFOACETAMIDO]CEPHALOSPORINS AND ANTIBACTERIAL COMPOSITIONS CONTAINING THEM

Hiroaki Nomura, Osaka; Takenori Hitaka; Hiroshi Akimoto, both of Hyogo; Isao Minami, Osaka; Fumio Kiriki, Hyogo; Tatsuichi Matsuda, Osaka, and Takeshi Fugono, Hyogo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

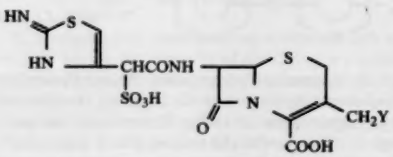
Filed Aug. 18, 1976, Ser. No. 715,495

Claims priority, application Japan, Aug. 25, 1975, 50-103327

Int. Cl.[2] A61K *31/545*; C07D *501/46, 501/34*

U.S. Cl. 424—246 **7 Claims**

1. A cephalosporin represented by the formula:



wherein Y is an acetoxy group, or a substituted or unsubstituted pyridinium, picolinium, quinolinium or lutidinium, the substituent being alkyl, halogen, carbamoyl, N-hydroxyalkyl, N-carboalkoxycarbamoyl, N-cyanocarbamoyl, carboxyalkyl, halogenated alkyl or hydroxyalkyl, the alkyl or alkoxy group in the substituent having from 1 to 4 carbon atoms, or a pharmaceutically acceptable salt thereof.

7. A medicinal composition for the therapy of diseases caused by bacteria which contains as an active ingredient an effective amount of the cephalosporin or pharmaceutically acceptable salt thereof claimed in claim 1.

4,132,790

ANTIBIOTIC A16886II

Marvin Gorman; Calvin E. Higgens, and Ramakrishnan Nagarajan, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 463,233, Apr. 23, 1974, which is a division of Ser. No. 62,390, Aug. 10, 1970, which is a continuation-in-part of Ser. No. 849,395, Aug. 12, 1969, abandoned. This application May 20, 1976, Ser. No. 688,211

Int. Cl.[2] A61V *31/54*

U.S. Cl. 424—246 **2 Claims**

1. A method for the inhibition of a plant-pathogenic bacterium which comprises applying to a plant exposed to the bacterium an amount of 7-(5-amino-5-carboxyvaleramido)-3-(carbamoyloxymethyl)-3-cephem-4-carboxylic acid which is effective to inhibit the growth of the bacterium.

4,132,791

USE OF ETOPERIDONE IN PARKINSONISM AND IN OTHER EXTRAPYRAMIDAL SYNDROMES CHARACTERIZED BY TREMORS

Bruno Silvestrini, Rome, Italy, assignor to Aziende Chimiche Riunite Angelina Francesco A.S.R.A.F. S.p.A., Rome Italy

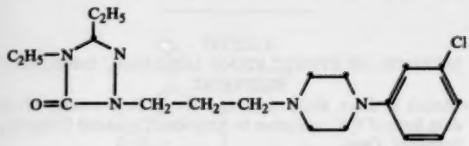
Filed May 3, 1977, Ser. No. 793,336

Claims priority, application Italy, May 5, 1976, 49321 A/76

Int. Cl.[2] A61K *31/495*

U.S. Cl. 424—250 **1 Claim**

1. A process for the treatment of tremors in Parkinsonism and in other extrapyramidal syndromes which comprises administering subcutaneously or intramuscularly to an adult human afflicted with Parkinsonism an amount of from 25 to 50 mg etoperidone of the formula:



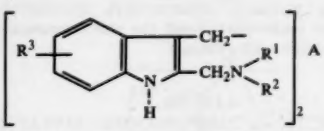
4,132,792

BIS(2-[(DISUBSTITUTED AMINO)METHYL]-1H-INDOLE) COMPOUNDS

Harold Zinnes, Rockaway, and Neil A. Lindo, New Providence, both of N.J., assignors to Warner-Lambert, Morris Plains, N.J.

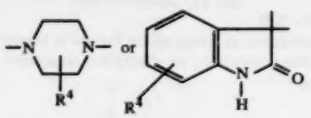
Filed Dec. 19, 1977, Ser. No. 861,762
Int. Cl.[2] A61K *31/495;* C07D *403/14*
U.S. Cl. 424—250 7 Claims

1. A compound of the formula



I

and pharmaceutically acceptable acid addition salts thereof wherein R^1 and R^2 are lower alkyl, R^3 is hydrogen, lower alkyl, halogen or lower alkoxy and A is a molecular fragment of the formulae



wherein R^4 is hydrogen or lower alkyl.

6. An antifungal pharmaceutical composition comprising an antifugal effective amount of a compound of claim 1 and a pharmaceutical carrier.

4,132,793

STABLE RED BEET COLOR COMPOSITION

George J. Haber, Staten Island, N.Y.; Chee T. Tan, Middletown, and Joanna Wu, Matawan, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Aug. 15, 1977, Ser. No. 824,769
Int. Cl.[2] A23L *1/275*
U.S. Cl. 426—250 7 Claims

1. A composition having a stabilized red color comprising 100 parts by weight of red beet dye at 68° Brix and intimately admixed therewith an acid selected from the group consisting of ascorbic acid and erythorbic acid, the quantity range of said acid in said composition being from 15 to 30 parts by weight, and sodium hexametaphosphate, the quantity of said sodium hexametaphosphate being from 10 parts to 30 parts by weight of said composition, whereby said ascorbic acid derivative in combination with said sodium hexametaphosphate creates a light and heat stabilization effect on said red beet dye.

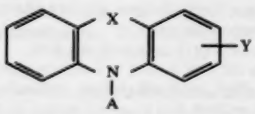
4,132,794

10-IMIDOYLACRIDAN COMPOSITIONS

Yao H. Wu, and Walter G. Lobeck, Jr., both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Division of Ser. No. 812,292, Jul. 1, 1977, Pat. No. 4,094,981, which is a division of Ser. No. 670,600, Mar. 26, 1976, Pat. No. 4,046,891, which is a division of Ser. No. 561,462, Mar. 24, 1975, Pat. No. 3,962,252, which is a division of Ser. No. 336,671, Feb. 28, 1973, Pat. No. 3,888,852. This application Apr. 6, 1978, Ser. No. 893,908
The portion of the term of this patent subsequent to Jun. 8, 1993, has been disclaimed.
Int. Cl.[2] A61K *31/435*
U.S. Cl. 424—257 7 Claims

1. A pharmaceutical composition in dosage unit form comprising a pharmaceutical carrier and an effective smooth muscle relaxant amount of a compound selected from the group consisting of 10-imidoylacridans having the formula



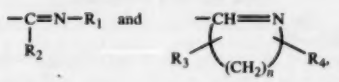
and a non-toxic pharmaceutically acceptable acid addition salt thereof wherein

X represents a divalent methylene radical of the formula

wherein

Z_1 and Z_2 are independently selected from hydrogen or straight chain lower alkyl of from 1 to 4 carbon atoms inclusive;

Y represents hydrogen, trifluoromethyl, halogen, dihalogen, lower alkyl of 1 to 4 carbon atoms inclusive, lower alkoxy of 1 to 4 carbon atoms inclusive; and is selected from the group consisting of



wherein

R_1 is lower alkyl of 1 to 4 carbon atoms inclusive or cycloalkyl of 3 to 5 carbon atoms inclusive;

R_2 is hydrogen or lower alkyl of 1 to 4 carbon atoms inclusive;

R_3 and R_4 are independent members selected from the group consisting of hydrogen or lower alkyl of 1 to 4 carbon atoms inclusive;

n is the integer of 3 to 5.

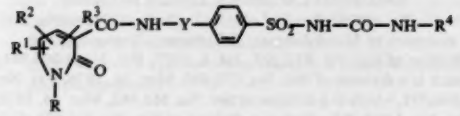
4,132,795

BENZENESULFONYL UREAS AND THEIR USE FOR THE TREATMENT OF DIABETES MELLITUS

Volker Hitzel, Hofheim am Taunus; Rudi Weyer, Kelkheim; Werner Pfaff, Hofheim am Taunus, and Karl Geisen, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 16, 1977, Ser. No. 797,132
Claims priority, application Fed. Rep. of Germany, May 18, 1976, 2621958
Int. Cl.[2] C07D *213/56;* A61K *31/455*
U.S. Cl. 424—266 8 Claims

1. A benzenesulfonyl urea of the formula



or a salt thereof in which

R represents alkyl, alkoxyalkyl, or alkenyl of up to 6 carbon atoms; cycloalkyl, cycloalkenyl, alkylcycloalkyl, alkylcycloalkenyl, cycloalkylalkyl, cycloalkenylalkyl, alkylcycloalkylalkyl, alkylcycloalkenylalkyl of from 5 to 9 carbon atoms; phenyl; phenyl mono- or disubstituted by alkyl or alkoxy of up to 4 carbon atoms, or by halogen; phenylalkyl having up to 3 carbon atoms in the alkyl moiety and optionally mono- or disubstituted in the phenyl radical by alkyl or alkoxy each having up to 4 carbon atoms, or by halogen;

R^1, R^2, R^3 stand for hydrogen, alkyl or alkoxy of up to two carbon atoms or halogen;

Y is alkylene of 2 or 3 carbon atoms, and

R^4 represents alkyl of from 3 to 6 carbon atoms; cycloalkyl, alkylcycloalkyl, cycloalkylalkyl, cycloalkenyl, alkylcycloalkenyl or from 5 to 9 carbon atoms, C_1 to C_2-alkylcyclopentylmethyl, cyclohexenylmethyl, chlorocyclohexyl, bicycloheptenylmethyl, bicycloheptylmethyl, bicycloheptenyl, bicycloheptyl, nortricyclyl, adamantyl or benzyl.

7. A method for the treatment of Diabetes mellitus which comprises administering to a host, in need of such treatment, an effective amount of a compound as defined in claim 1.

4,132,796

ANTIPSYCHOTIC 3-TRIFLUOROMETHYLSULFINYL ANALOGS OF CYPROHEPTADINE

David C. Remy, North Wales, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

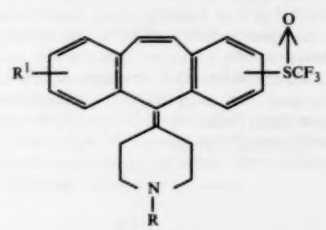
Filed Dec. 1, 1977, Ser. No. 856,556

The portion of the term of this patent subsequent to Jun. 21, 1994, has been disclaimed.

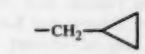
Int. Cl.[2] C07D *211/24;* A61K *31/445*

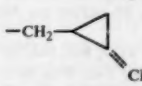
U.S. Cl. 424—267 **8 Claims**

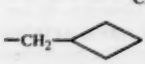
7. A method of treating psychoses which comprises the administration to a patient in need of such treatment an effective antipsychotic amount of a compound of structural formula:



or pharmaceutically acceptable salt thereof, wherein

(1) 

(2) 

(3) 

(4) $-CH_2CH_2OH$; and R^1 is hydrogen, C_{1-3} alkyl or fluoro.

4,132,797

METHOD OF STIMULATING LEUKEMIC IMMUNE RESPONSE

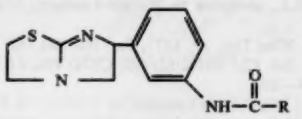
Frederick E. Durr, Ridgewood, and Martin R. Damiani, Allendale, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jun. 20, 1977, Ser. No. 807,780

Int. Cl.[2] A61K *31/425*

U.S. Cl. 424—270 **7 Claims**

1. A method for stimulating the leukemic immune response in a warm-blooded animal in need of said stimulation which comprises orally administering to said animal an effective leukemic immunostimulating amount of a racemic mixture or levorotatory isomer of a compound selected from the group consisting of those of the formula:



wherein R is methoxy, chloromethyl, cyclohexyl, m-chlorophenyl or p-nitrophenyl and the pharmaceutically acceptable acid-addition salts thereof.

4,132,798

PHARMACEUTICAL COMPOSITIONS CONTAINING 4-AMIDO-THIAZOLES

Roger Crossley, Reading, England, assignor to John Wyeth & Brother Ltd., Taplow, England

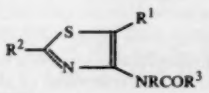
Filed Mar. 16, 1978, Ser. No. 887,159

Claims priority, application United Kingdom, Mar. 29, 1977, 13233/77

Int. Cl.[2] A61K *31/425*

U.S. Cl. 424—270 **15 Claims**

1. A pharmaceutical composition for use in treating ulcers or hypersecretion comprising an effective amount of a compound of formula I



(I)

wherein R is hydrogen, alkyl of 1 to 6 carbon atoms, or COR^3 where R^3 is hydrogen, alkyl of 1 to 5 carbon atoms, alkenyl of 2 to 5 carbon atoms or cycloalkyl of 3 to 5 carbon atoms; R^1 is hydrogen or alkyl of 1 to 6 carbon atoms, R^2 is alkyl of 1 to 6 carbon atoms or phenyl optionally substituted by halogen, alkyl of 1 to 6 carbon atoms or alkoxy of 1 to 6 carbon atoms, and R^3 is as defined above, and a pharmaceutically acceptable carrier.

4,132,799

N-(BENZOXAZOLINYL-2-ONE)-TRICYCLIC DICARBOXIMIDES

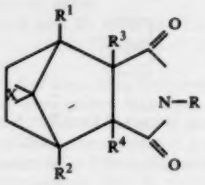
Kenneth L. Shepard, Ambler, and William J. Paleveda, Jr., Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 713,765, Aug. 12, 1976, Pat. No. 4,061,763, which is a division of Ser. No. 575,918, May 9, 1975, Pat. No. 4,006,233, which is a continuation-in-part of Ser. No. 511,961, Oct. 4, 1974, abandoned. This application Sep. 8, 1977, Ser. No. 831,463

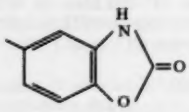
Int. Cl.[2] A61K *31/42;* C07D *413/04*

U.S. Cl. 424—272 **4 Claims**

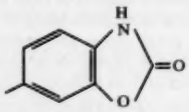
1. A compound having the formula:



Wherein:
R^1, R^2, R^3 and R^4 are hydrogen,
X is $-CH_2-$ or $-CH=CH-$
R is

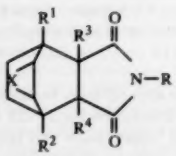


or

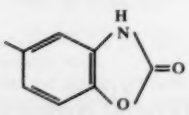


and a non-toxic pharmaceutically acceptable salt thereof.

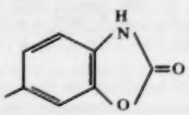
3. A tranquilizing pharmaceutical composition comprising a therapeutically effective amount in unitary dosage form of a compound having the formula:



Wherein:
R^1, R^2, R^3 and R^4 are hydrogen,
X is $-CH_2-$ or $-CH=CH-$
R is



or



and a non-toxic pharmaceutically acceptable salt thereof.

4,132,800
S-P-METHOXYPHENYL N,N-DIALLYLTHIOLCARBAMATE AND S-P-METHOXYPHENYL N,N-BIS(2,3-DIBROMOPROPYL)THIOLCARBAMATE
Frederick F. Guzik, Wadsworth, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.
Filed Nov. 13, 1975, Ser. No. 631,802
Int. Cl.[2] A01N *9/12*; C07C *155/02*
U.S. Cl. 424—300 **17 Claims**

1. S-p-methoxyphenyl N,N-bis(2,3-dibromopropyl)thiolcarbamate.

4,132,801
CONTROL OF PLANT FUNGI WITH S-p-METHOXYPHENYL N-2,3-DIBROMOPROPYLTHIOLCARBAMATE
William E. Bissinger, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.
Division of Ser. No. 631,751, Nov. 13, 1975, Pat. No. 4,046,912. This application Jun. 22, 1977, Ser. No. 808,746
Int. Cl.[2] A01N *9/12*
U.S. Cl. 424—300 **3 Claims**

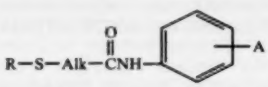
1. A method of protecting plants against foliar fungus disease resulting from fungus of the genera Puccinia and Phytophthorans, which comprises:

applying a fungicidally effective amount of S-p-methoxyphenyl N-2,3-dibromopropylthiolcarbamate to the foliage of the plant prior to infection of said plant with the fungus disease to control said fungus disease.

4,132,802
BENZOIC ACID DERIVATIVE AND BENZENESULFONIC ACID MUCOLYTIC PROCESS
Tellis A. Martin, and William T. Comer, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.
Division of Ser. No. 733,598, Oct. 18, 1976, Pat. No. 4,096,277, which is a division of Ser. No. 579,650, May 21, 1975, Pat. No. 4,005,222. This application Mar. 24, 1978, Ser. No. 889,667
Int. Cl.[2] A61K *31/255*
U.S. Cl. 424—303 **5 Claims**

1. A process for liquefaction of mucus which comprises contacting said mucus with a mucolytically effective amount of a member selected from the group consisting of compounds having Formula I

Formula I



wherein

A is meta or para SO_3H;

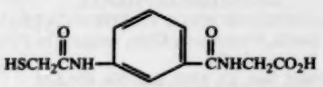
Alk is a straight or branched divalent alkylene radical of from 1 to 3 carbon atoms inclusive;

R is hydrogen or alkanoyl having up to 18 carbon atoms inclusive; and a pharmaceutically acceptable salt thereof.

4,132,803
MERCAPTOACYLAMIDOBENZOYLGLYCINE MUCOLYTIC PROCESS AND COMPOSITIONS
Tellis A. Martin, Evansville, Ind., assignor to Mead Johnson & Company, Evansville, Ind.
Continuation-in-part of Ser. No. 806,877, Jun. 15, 1977, Pat. No. 4,093,739. This application Mar. 24, 1978, Ser. No. 889,674
Int. Cl.[2] A61K *31/205, 31/195*
U.S. Cl. 424—316 **10 Claims**

1. A pharmaceutical composition in dosage unit form adapted for intratracheal administration to a mammal comprising a pharmaceutical carrier and a mucolytic effective amount of an active ingredient selected from the group consisting of

N-[3-(mercaptoacetylamino)benzoyl]glycine characterized by formula I



(I)

and a pharmaceutically acceptable salt thereof wherein said salt is anhydrous or hydrated.

4,132,804

PROCESS OF TREATING ASTHMA

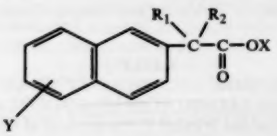
Margaret E. Greig, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 665,639, Mar. 10, 1976, abandoned, which is a continuation of Ser. No. 573,051, Apr. 30, 1975, abandoned, which is a continuation of Ser. No. 479,211, Jun. 14, 1974, abandoned, which is a continuation-in-part of Ser. No. 384,818, Aug. 2, 1973, abandoned, which is a continuation of Ser. No. 258,352, May 31, 1972, abandoned. This application Apr. 28, 1977, Ser. No. 792,090

Int. Cl.[2] A61K *31/19, 31/215*

U.S. Cl. 424—317 **3 Claims**

1. A process for the prophylactic treatment of asthma comprising the systemic administration of from 1 to 1000 mg. of a compound of the formula:



wherein Y is lower alkyl of 1 to 8 carbon atoms, cyclopropyl, ethinyl, $-CF_3$, $-F$, $-Cl$, $-OCH_3$, $-OCHF_3$, $-OCH_2OCH_3$, $-SCH_3$, $SCHF_2$, $-SCH_2OCH_3$, acetyl; R_1 and R_2 are H, CH_3, CHF_2, or taken together are $=CH_2$ or $=CF_2$1 and X is hydrogen, lower alkyl of 1 to 8 carbon atoms, or a pharmacologically acceptable cation in association with a pharmaceutical carrier to an asthmatic human or animal subject.

4,132,805

NOVEL SOFT N-CHLOROAMINO ALCOHOL DERIVATIVES EXHIBITING ANTIBACTERIAL ACTIVITY

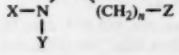
James J. Kaminski, and Nicolae S. Bodor, both of Lawrence, Kans., assignors to INTERx Research Corporation, Lawrence, Kans.

Division of Ser. No. 803,868, Jun. 6, 1977, which is a division of Ser. No. 632,012, Nov. 14, 1975, Pat. No. 4,036,843. This application Oct. 3, 1977, Ser. No. 838,907

Int. Cl.[2] A01N *9/24*

U.S. Cl. 424—312 **29 Claims**

1. A method for inhibiting bacterial growth which comprises applying to said bacterial growth an antibacterially effective amount of a compound having the formula:



(I)

wherein X and Y each represent a member which may be the same or different selected from the group consisting of H and Cl with the proviso that X and Y cannot represent H simultaneously; R_1 and R_2 each represent a member which may be the same or different selected from the group consisting of n- or branched alkyl of from 1 to 20 carbon atoms, phenyl, naphthyl and

wherein m represents an integer of from 2 to 5; n represents an integer of 1 to 8; and Z represents $-OOCR_3$, wherein R_3 represents n- or branched alkyl of 1 to 20 carbon atoms.

4,132,806

NOVEL PRECIPITATED SILICEOUS PRODUCTS

Satish K. Wason, Havre de Grace, Md., assignor to J. M. Huber Corporation, Locust, N.J.

Division of Ser. No. 557,707, Mar. 12, 1975, abandoned. This application May 16, 1977, Ser. No. 797,268

Int. Cl.[2] A61K *47/00*

U.S. Cl. 424—357 **1 Claim**

1. A pharmaceutical and cosmetic composition containing, as a viscosity control agent, a finely divided, amorphous, precipitated silicon dioxide having:

(a) a wet cake moisture content of from between about 77.9 to 83.5% where it is between about 77.9 to 83.2% in the presence of a metal cation and between about 79.8 to 83.5% in the absence of said metal cation;

(b) a structure index of from between about 350 to 505 where it is between about 350 to 495 in the presence of said metal cation and between about 395 to 505 in the absence of said metal cation;

(c) an oil absorption of from between about 190 to 212 cc/100 grams where it is between about 193 to 212 cc/100 grams in the presence of said metal cation and between about 190 to 202 cc/100 grams in the absence of said metal cation;

(d) a void volume of from between about 3.19 to 4.44 cc Hg/g SiO_2 where it is between about 3.19 to 4.44 cc Hg/g SiO_2 in the presence of said metal cation and between about 3.55 to 4.14 cc Hg/g SiO_2 in the absence of said metal cation;

(e) a BET surface area of from between about 120 to 220 m^2/g where it is between about 153 to 220 m^2/g in the presence of said metal cation and between about 120 to 153 m^2/g in the absence of said metal cation; and

(f) a percent friability of from between about 20 to 98% where it is between about 28 to 93% in the presence of said metal cation and between about 20 to 98% in the absence of said metal cation;

wherein said silicon dioxide comprises at least 90% SiO_2 and said metal cation is selected from the group consisting of aluminum, magnesium, zinc and calcium.

4,132,807

PELLETIZING COTTON LINT

Gene L. Duke, P.O. Box 988, Brownfield, Tex. 79316

Division of Ser. No. 277,400, Aug. 2, 1972, Pat. No. 4,055,608. This application Jun. 3, 1977, Ser. No. 803,154

Int. Cl.[2] A23K *1/02, 1/14*

U.S. Cl. 426—2 **15 Claims**

1. The method of handling lint produced as a byproduct from the dry acid process of delinting cottonseed comprising:

a. pelletizing the lint by

b. extruding the lint through a die in a standard pellet mill.

4,132,808

METHOD OF FEEDING YOUNG ANIMALS

Madhu L. Kakade, St. Paul, Minn., assignor to Land O'Lakes, Inc., Minneapolis, Minn.

Filed Dec. 20, 1976, Ser. No. 752,456
Int. Cl.[2] A23K *1/18*
U.S. Cl. 426—2 4 Claims

1. The method of improving the growth rate of young animals employing monogastric digestion comprising: heating a soybean substance selected from the group consisting of full-fat, low-fat and defatted soybeans in particulate form, in the presence of water and a lower alcohol for approximately 30 minutes at approximately 250° F. wherein said heating step involves exposing the substance directly to steam under pressure; removing substantially all of the water and alcohol therefrom by vaporization thereby, producing a dried particulate flour having a PDI of not greater than about 30; mixing said flour with other nutritional materials and water to provide a milk-like substance, and feeding the mixture to said animals.

4,132,809

CONTEXTURED SEMIMOIST MEAT ANALOGS

Norman W. Desrosier, 18 Old Hill Farms Rd., Westport, Conn. 06880

Continuation-in-part of Ser. No. 748,363, Dec. 7, 1976, abandoned. This application Jul. 25, 1977, Ser. No. 818,501
Int. Cl.[2] A23J *3/00*; A23L *3/34*
U.S. Cl. 426—104 17 Claims

1. A process of making a meat analog and comprising steps as follows:

moisture cooking textured soy protein particles in 1% of 3% by weight of common salt water solution until the particles become soft and pliable;

drying the cooked particles to a moisture content of 30 to 60% to produce a matrix;

adding to the matrix 10% to 80% by weight of a functional protein source selected from a group consisting of whey solids, skim milk solids, egg solids and wheat gluten;

kneading and grinding the protein-matrix mixture to disperse and develop the functional protein source intimately within the matrix;

rough grinding the kneaded and ground matrix so that it resembles ground meat chunks;

adding to the rough ground matrix 1% to 10% by weight of an edible humectant;

drying the rough ground humectant treated matrix to a moisture content of 20 to 35%; and then

heating the dried humectant treated matrix at a temperature to set said mixture and to provide a meat analog product having moist chewy meatlike texture which persists in subsequent cooking.

4,132,810

PROCESS FOR PREPARING FABRICATED BACON

Richard K. Knutson, Minneapolis, Minn., assignor to General Mills, Inc., Minneapolis, Minn.

Filed Jun. 24, 1977, Ser. No. 810,553
Int. Cl.[2] A23L *1/31*
U.S. Cl. 426—104 17 Claims

1. A process for preparing a partially cooked fabricated bacon including the steps of:

(a) preparing lean and white portions for the fabricated bacon by separately mixing combinations of ingredients therefore, said combinations respectively comprising

(1) from about 50% to 97% by weight comminuted meat, from about 3% to about 30% by weight binder and from about 5% to about 30% by weight added water, and

(2) from about 75% to about 95% by weight comminuted meat, from about 0.5% to about 15% by weight salt and from about 3% to about 30% by weight added water

wherein the amount of fat in the lean portion (1) is from about 5% to about 50% by weight, the amount of fat in the white portion (2) is from about 1% to about 20% by weight and the ratio of the said fat contents is in the range of 3:1 to 1:1 and such that upon being fried in hot oil the lean portion will shrink whereas the white portion will puff, and

wherein the mixing of the white portion is sufficient to effect solubilization of the meat protein in conjunction with the solubilizing action of the salt, such solubilizing also facilitating the forming of a crisp texture in the white portion when the same is fried in hot oil;

(b) forming the lean portion and the white portion into a loaf having at least one distinctive lean area and at least one distinctive white area; and

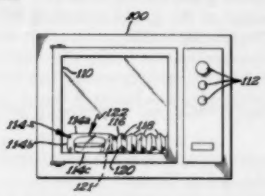
(c) cooking the loaf under controlled humidity conditions such that the interior temperature of the loaf is at least 45° C. but less than 77° C. to obtain the partially cooked fabricated bacon.

4,132,811

FOOD PACKAGE FOR ASSURING UNIFORM DISTRIBUTION OF MICROWAVE ENERGY AND PROCESS FOR HEATING FOOD

Charles N. Standing, and Lawrence C. Brandberg, both of Minneapolis, Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Continuation-in-part of Ser. No. 474,490, May 30, 1974, abandoned. This application Dec. 3, 1976, Ser. No. 747,277
Int. Cl.[2] B65B *25/22*
U.S. Cl. 426—111 10 Claims



1. A method for more uniformly exposing food products to microwave energy comprising, providing a package containing a vaporizable liquid having a food-filled portion and an expandable vessel, providing contact between the vessel and the food-filled portion, exposing the food-filled portion and the vessel to microwave energy sufficient to heat the food and vaporize the liquid to cause expansion of the vaporized liquid in the vessel, the vaporized liquid causing the vessel to expand and push against the food-filled portion to change the location thereof in the oven and thereby force the food to move bodily from one position to another with respect to the oven as a result of the expansion of the vessel and the resulting movement of the food distributing non-uniform microwave energy more uniformly in the food product, the vessel being vertically expandable and the food-filled portion being positioned on top of the vertically expandable vessel whereby expansion of the vessel moves the food-filled portion upwardly in the oven when the vessel is exposed to microwave energy.

4,132,812

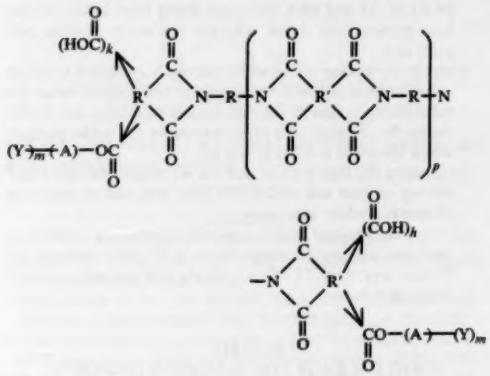
PHOTOCURABLE IMIDIZABLE POLYENE-POLYTHIOL COMPOSITIONS

Eckart Mathias, Catonsville, Md., assignor to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 830,225, Sep. 2, 1977, which is a continuation-in-part of Ser. No. 753,750, Dec. 23, 1976, Pat. No. 4,080,484. This application Nov. 15, 1977, Ser. No. 851,680
Int. Cl.[2] B05D *3/06*
U.S. Cl. 427—44 6 Claims

1. The process of coating a substrate which comprises (1) applying to a substrate a curable composition comprising

(A) an imide containing polyene of the formula:

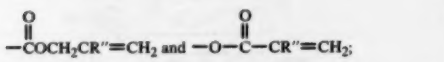


wherein → denotes isomerism, R is a divalent organic moiety remaining after a secondary diamide has reacted with adjacent carboxylic acid groups to form imide linkages;

R′ is an aromatic residue attached to at least 3 carbonyl groups at least two of which groups are attached to adjacent carbon atoms on the aromatic residue;

A is an alkylene group having from 1 to 10 carbon atoms;

Y is a member of the group consisting of $-CR''=CH_2$, $-O-(CH_2)_d-CR''=CH_2$,



R″ is hydrogen or methyl; k and h are 0 or 1; m and d are 1 to 10 and p is 0 to 10, and

(B) a polythiol having a molecular weight in the range from about 94 to 20,000 of the general formula: $R_8-(SH)_n$ where n is at least 2 and R_8 is a polyvalent organic moiety, the sum of m and n being greater than 3, the polyene/polythiol mole ratio being in the range 0.2 to 8.0:1, respectively, and, thereafter, (2) exposing said curable composition under ambient conditions to a free radical generator to form a solidified, cured imide containing polythioether coating on said substrate.

4,132,813

METHOD FOR PRODUCING SOLDERABLE METALLIZED LAYER ON A SEMICONDUCTING OR INSULATING SUBSTRATE

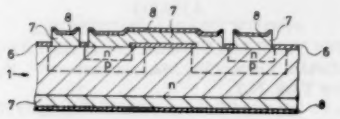
Gerhard Schaal, Belsen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 22, 1976, Ser. No. 734,770

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1975, 2550512

Int. Cl.² C23L *13/02*

U.S. Cl. 427—90 **13 Claims**



1. A method of manufacturing a solderable metallized layer of high transverse electrical conductivity on a substrate, in which heat-tempering of an aluminum layer is necessary to provide adequate mechanical and electrical contact thereof and a nickel layer is provided for solderability, comprising the steps of:

applying to said substrate (1) an aluminum layer (7) of a thickness in the range of 3 to 10 μm;

applying under vacuum on top of said aluminum layer (7), a layer of nickel (8) which provides the entire nickel content of the metallization and has a thickness in the range from 0.6 to 1.0 μm, the application of said nickel layer being performed without interruption of the vacuum established for the previous application of aluminum;

performing the tempering of the aluminum layer necessary for improving its electrical contact capability by heating said substrate and said applied layers, after the deposition of all of said nickel layer, to a temperature in the range of 400 to 480° C. and then maintaining said substrate and said applied layers at such a temperature for a period of not more than 20 minutes, whereby the electrical contact of said aluminum layer is improved without impairing the solderability of said nickel layer.

4,132,814

ANTI-DUSTING PROCESS FOR CARBON RESISTORS

Paul V. De Luca, Port Washington; William V. Carney, Valley Stream, and Arnold S. Louis, Hastings on Hudson, all of N.Y., assignors to Porta Systems Corp., Syosset, N.Y.

Filed Nov. 7, 1977, Ser. No. 849,506

Int. Cl.² B05D *1/18, 5/12*

U.S. Cl. 427—113 **1 Claim**

1. In the process of manufacturing carbon electrodes thermally bonded to a ceramic housing, in which the bonding process at least partially destroys the structural integrity of the electrode by creating voids between adjacent carbon particles, the steps of subsequently treating said electrodes comprising:

providing a water solution of polyethylene glycol of approximately one ounce per gallon of water;

submerging said electrodes in said solution for a time period sufficient to allow penetration through the entire body of the electrode; and

retrieving said electrodes and allowing the water vehicle to evaporate, leaving the individual carbon particles comprising the electrode coated with a layer of polyethylene glycol of approximately 0.005 inch thick.

4,132,815

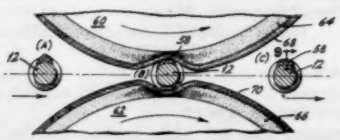
METHOD OF MAKING SELF-LOCKING FASTENERS WITH A PRESSURE ROLLED THERMOPLASTIC PATCH

James W. Cadwallader, Lansdale, Pa., assignor to SPS Technologies, Inc., Jenkintown, Pa.

Continuation of Ser. No. 639,324, Dec. 10, 1975, abandoned. This application Aug. 29, 1977, Ser. No. 828,399

Int. Cl.² B05D *3/02*; F16B *39/24*

U.S. Cl. 427—194 **9 Claims**



1. A method of making a self-locking, externally threaded fastener of the type having a resilient, deformable patch of thermoplastic resin material bonded to the thread surface, comprising the steps of:

heating said external thread surface to a temperature at least equal to the melting temperature of said thermoplastic resin material;

depositing said thermoplastic resin material in powder form on said heated external thread surface over a preselected

circumferential extent less than 180°, whereby said thermoplastic resin material is fusion bonded to said external thread surface, said resin material being applied in an amount sufficient that the resin material extends above some portion of the fastener thread crests; and applying rolling pressure to said thermoplastic resin material to form said patch, thereby displacing the excess resin material above the thread crests into the root areas of the threads, thus controlling and limiting the radial height of the patch above the thread crests within the normal envelope of the basic major diameter of the fastener thread.

4,132,816

GAS PHASE DEPOSITION OF ALUMINUM USING A COMPLEX ALUMINUM HALIDE OF AN ALKALI METAL OR AN ALKALINE EARTH METAL AS AN ACTIVATOR

Robert S. Benden, Rocky Hill, and Richard S. Parzuchowski, Glastonbury, both of Conn., assignors to United Technologies Corporation, East Hartford, Conn.

Filed Feb. 25, 1976, Ser. No. 661,903
Int. Cl.² C23C *11/00*
U.S. Cl. 427—237 **8 Claims**

1. A gas diffusion process for providing an aluminum coating on internal passages in a metal substrate selected from a group consisting of iron, chromium, cobalt, and nickel-base alloys which comprises:

(a) Heating a powder mixture comprising a source of aluminum, a carrier material selected from the group consisting of complex aluminum halides of alkaline earth metals and mixtures of aluminum halide with a material selected from the group consisting of alkaline earth halides and alkali metal halides, and an inert filler to a temperature sufficient to cause evolution of aluminum-containing gases; and

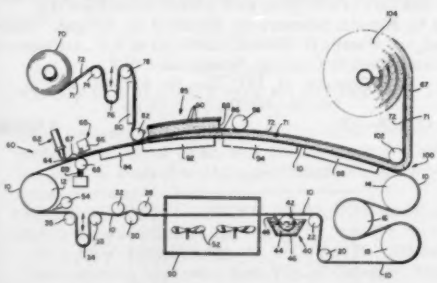
(b) Passing said gases through internal passages of said substrate while said substrate is maintained out of contact with said powder mixture and at a temperature sufficient to produce aluminum diffusion onto the internal surfaces of said part.

4,132,817

METHOD FOR FORMING A LAYER OF BLOWN CELLULAR URETHANE ON A CARPET BACKING

John G. Tillotson, Dalton, Ga., assignor to Textile Rubber and Chemical Co., Inc., Dalton, Ga.

Continuation-in-part of Ser. No. 782,636, Mar. 30, 1977. This application Jan. 25, 1978, Ser. No. 872,341
Int. Cl.² B05D *5/00*
U.S. Cl. 427—244 **13 Claims**



1. Method of forming a layer of blown cellular urethane on a carpet backing fabric comprising the steps of:

(a) preparing a mixture of reactive urethane forming agents containing sufficient water to cause chemical blowing of the mixture when heated sufficiently, and controlling the temperature of the mixture to a temperature of between about 60° and 100° F.;

(b) providing an endless conveyor belt;

(c) applying an elastomeric film to said conveyor belt;

(d) depositing the mixture of reactive urethane forming agents onto the film and conveyor belt while the temperature of the film and belt are controlled as to temperature;

(e) preheating the lower surface of an uncoated carpet material to a temperature of between 100° and 300° F.;

(f) heating the urethane forming mixture to cause chemical blowing thereof and bringing the lower surface of the preheated carpet into flush contact with the heated urethane forming mixture;

(g) applying pressure to the carpet material while the reactive mixture is undergoing chemical blowing;

(h) heating the urethane forming mixture after the preheated carpet is brought into flush contact with the mixture; and

(i) stripping the coated carpet material from the conveyor belt.

4,132,818

METHOD OF FORMING DEPOSITS FROM REACTIVE GASES

Ronald E. Chappelow, Jericho, and Harry J. Hunkele, South Hero, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1976, Ser. No. 700,988
Int. Cl.² C23C *11/00*
U.S. Cl. 427—248 R **6 Claims**

1. The method of depositing from a gas phase a substantially uniformly thick layer of a solid onto an elongated load wherein a reactive gas, thermally convertible to the solid, is entrained in a carrier gas and passed over and along the surface of the load comprising the steps of:

entraining a reactive gas in a carrier gas,

sequentially changing the flow rate of the carrier gas across the load to progressively shift the distribution of the reaction rate across the surface of the load, and

simultaneously changing the time said carrier gas, carrying said entrained reactive gas, is flowing over said load,

said load being an elongated load and said reactive gas and said carrier gas is passed over on the surface of the load in the direction of the elongation of the load.

4,132,819

METHOD OF SHAPING AN ORGANIC POLYMER INSOLUBLE IN A POLAR SOLVENT

Luigi Giuffre; Placido M. Spaziante; Vittorio Pozzi, and Giovanni Modica, all of Milan, Italy, assignors to Oronzio de Nora Impianti Elettrochimici S.p.A., Milan, Italy

Filed Nov. 17, 1976, Ser. No. 742,640
Claims priority, application Italy, Dec. 3, 1975, 29951 A/75
Int. Cl.² B05D *3/10*
U.S. Cl. 427—341 **10 Claims**

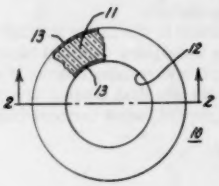
1. A method of shaping an organic polymer insoluble in a polar solvent comprising reacting an insoluble organic polymer containing at least one electron attracting group with a sufficient amount of a lower alkylene oxide to alkoxylate the electron attracting group to a degree sufficient to make the alkoxylated product soluble or easily dispersible in a polar solvent, dissolving or dispersing the resulting alkoxylated product in a polar solvent to obtain a solution or dispersion, shaping the resulting product into the desired form by applying the said solution or dispersion to a support and removing the polar solvent, and subjecting the alkoxylated product to hydrolysis to obtain the original polymer in the desired form.

4,132,820

COMPOSITE BODY WITH BETA-ALUMINA SUBSTRATE AND GLASS-COATING THEREON

Stephan P. Mitoff, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 9, 1977, Ser. No. 804,941
Int. Cl.[2] B32B 3/24, 17/06
U.S. Cl. 428—65 5 Claims



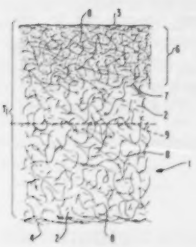
1. A composite body comprising a sodium beta-alumina substrate having at least one aperture therethrough, and a sodium resistant, low alkali ion-conductance glass coating covering and adhering to the entire external surface of the substrate, the glass coating having a coefficient of thermal expansion of 7.3 to 6.1 $\times$ 10^{-6} inches/inch/° C.

4,132,821

TEXTILE FABRIC WITH LEATHER-LIKE APPEARANCE

John J. Hiers, Elkin, and Stephen A. Wald, Winston-Salem, both of N.C., assignors to Scott Chatham Company, Hamptonville, N.C.

Filed Sep. 22, 1977, Ser. No. 835,693
Int. Cl.[2] B32B 5/16
U.S. Cl. 428—151 38 Claims



1. A non-woven textile composite which stimulates the strength, durability, appearance, temper, smooth surface, break, hand and feel of natural leather comprising:

(a) a non-woven needled textile fabric substrate having a coherent network of randomly entangled essentially uniform textile fibers with substantially no needle pick-up gradient and with an as needled overall bulk density of at least 6 pounds/cubic foot and having a face surface and a back surface, and a geometric center there-between;

(b) a shape-sustaining immobilized polymeric composition differentially disposed in the substrate such that there is at least 25% more polymeric composition between the face surface and the geometric center than between the back surface and the geometric center;

(c) and wherein the substrate and immobilized polymeric composition are in a co-compacted state such that the thickness of the co-compacted substrate and immobilized polymeric composition are less than 0.75 the thickness thereof in the essentially uncompacted state.

4,132,822

LAMINATES CONTAINING POLYESTER RESIN FINISHES

Marco Wismer, Gibsonia, and Robert De Majistre, Natrona Heights, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 135,794, Apr. 20, 1971, abandoned.
This application Aug. 10, 1973, Ser. No. 387,403
Int. Cl.[2] B32B 33/00, 27/36, 31/20
U.S. Cl. 428—196 23 Claims

1. A method of preparing a decorative composite article comprising a core section, an intermediate decorative layer, and a polyester resin protective layer which comprises:

A. placing an adhesive-impregnated or coated decorative sheet on a core section;

B. applying a polyester resin composition comprising an unsaturated polyester of an ethylenically unsaturated polycarboxylic acid and a polyhydric alcohol, an ethylenically unsaturated monomer, a peroxide catalyst and a photosensitizer to a release material and subjecting the polyester resin composition to actinic light to gel said composition without completely curing;

C. placing the gelled polyester resin composition backed with release material on the decorative sheet;

D. applying sufficient heat and pressure to cure the polyester resin and bond the layers into a unitary composite structure and,

E. removing the release material.

10. The composite structure formed by the method of claim 1.

4,132,823

POLY(ARYLENE SULFIDE) RESIN COATINGS

Jennings P. Blackwell, and Donnie G. Brady, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 23, 1977, Ser. No. 780,556
Int. Cl.[2] B32B 27/28, 15/20, 15/08, 27/08
U.S. Cl. 428—215 8 Claims

1. An arylene sulfide polymer coated structure comprising:

(a) a copper-containing metal substrate in which at least 50 weight percent of the substrate is copper, having bonded thereto:

(b) a layer of a polyimide and

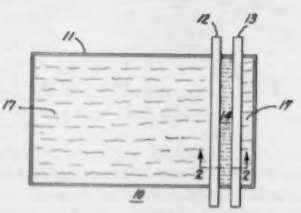
(c) a layer of an arylene sulfide polymer cured and bonded to said polyimide layer.

4,132,824

METHOD FOR CASTING ULTRATHIN METHYLPENTENE POLYMER MEMBRANES

Shiro G. Kimura, Schenectady; Raymond G. Lavigne, Waterford, and Warella R. Browall, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 21, 1977, Ser. No. 817,828
Int. Cl.[2] B01D 53/22, 39/16
U.S. Cl. 428—220 8 Claims



1. An ultrathin film of polymeric composition comprising blend of a methylpentene polymer and an organopolysiloxane-polycarbonate interpolymer, said interpolymer being present in an amount of up to about 100 parts by weight per 100 parts

by weight of said methylpentene polymer, said film characterized with an O_2/N_2 separation factor having a value of at least 2.3, substantially uniform thickness of less than about 1000 Angstroms, and substantial resistance to flux decay.

4,132,825

COMPOSITE STRUCTURAL MEMBER, ESPECIALLY FOR DYNAMIC LOADS

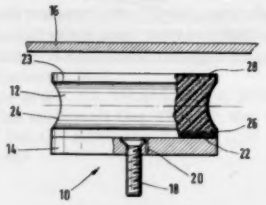
Hans-Jürgen Hahn, Hamburg, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed May 26, 1976, Ser. No. 690,025

Claims priority, application Fed. Rep. of Germany, May 30, 1975, 2524011

Int. Cl.² B32B *5/18, 27/40, 15/08*

U.S. Cl. 428—311 **12 Claims**



1. A dynamic load transmitting composite structural device comprising load introducing means (**14, 18**), a load take-up metal element (**16**) and an intermediate means (**12**), as well as adhesive bonds between said intermediate means and said load introducing means as well as between said intermediate means and said load take-up element, said adhesive bonds bonding said intermediate means to said load take-up element, and to said load introducing means, said intermediate means comprising at least one pressure cast polyurethane blank having open cells, said adhesive bonds comprising a slowly curing, moisture curable polyurethane prepolymer slowly cured in a humid atmosphere in intimate contact with said open cells, whereby the prepolymer penetrates into said open cells to form a mechanical anchoring as well as a chemical bond capable of taking-up repeatedly applied dynamic loads, said load introducing means comprising a load distribution metal plate (**14**) and a load applying member (**18**) rigidly secured to said load distribution metal plate bonded to said open cells of said blank, whereby the dynamic load is introduced substantially at a point and transmitted to said load take-up element substantially over a surface area.

4,132,826

DISPOSABLE BLANKET FOR AN OFFSET PRINTING MACHINE

Guido Dessauer, Dusseldorf-Gerresheim; Egon Leisner, Dusseldorf, and Alfred Rohr, Bad Salzuflen, all of Germany, assignors to Feldmühle Aktiengesellschaft, Dusseldorf-Oberkassel, Germany

Continuation of Ser. No. 682,571, May 3, 1976, abandoned, which is a continuation-in-part of Ser. No. 450,079, Mar. 11, 1974. This application Sep. 14, 1977, Ser. No. 833,305

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1973, 2312596

Int. Cl.² B32B *3/26;* **B41M** *5/00*

U.S. Cl. 428—314 **10 Claims**

1. A disposable offset printing blanket consisting essentially of:

(a) a flexible carrier sheet; and

(b) a coating on one face of said sheet having a thickness of 30 to 300 microns,

(1) said coating consisting essentially of a cellular, cross-linked, synthetic elastomer, the coating having a dry bulk density of 0.2 to 0.4 g/cm^3,

(2) the amount of cross-linking of said elastomer being effective for establishing the balance of hydrophilic and oleophilic properties of said elastomer necessary for receiving an inked image from a damped offset plate and for transmitting said image to a sheet of paper by contact with said plate and with said sheet of paper respectively.

4,132,827

MAGNETIC RECORDING SUBSTANCE

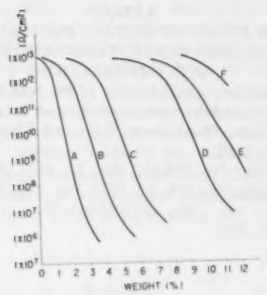
Yoshito Mukaida; Masaaki Fujiyama; Shigeo Komine; Masaaki Igarashi; Nobutaka Yamaguchi; Shinobu Iida, and Akira Kasuga, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jan. 18, 1977, Ser. No. 760,269

Claims priority, application Japan, Jan. 20, 1976, 51/4583

Int. Cl.² H01F *10/02;* **B32B** *27/20*

U.S. Cl. 428—329 **9 Claims**



1. A magnetic recording medium comprising a non-magnetic support and a magnetic recording layer provided thereon containing at least 0.5% by weight based on the magnetic material in the magnetic recording layer of carbon black having a surface area of at least 700 m^2/g and oil absorption of at least 300 ml (dibutyl phthalate)/100 g.

4,132,828

ASSEMBLY OF METAL-COATED CARBON FIBERS, PROCESS FOR PRODUCTION THEREOF, AND METHOD FOR USE THEREOF

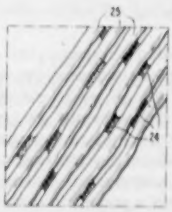
Kazuo Nakamura, Tokyo; Yoshito Fukube, and Takashi Osaki, both of Chiba, all of Japan, assignors to Toho Beslon Co., Ltd., Tokyo and Nihon Shinku Gijutsu Kabushiki Kaisha, Chigasaki, both of, Japan

Filed Jun. 24, 1977, Ser. No. 809,813

Claims priority, application Japan, Nov. 26, 1976, 51-141165

Int. Cl.² B05D *3/06*

U.S. Cl. 428—366 **39 Claims**



1. An assembly of a plurality of carbon fibers each coated with a matrix metal layer, the coated fibers having bonding

points at the metal layers to form a two-dimensional network structure or both a two-dimensional network structure and a three-dimensional network structure, said bonding points being present to such an extent that individual carbon fibers do not substantially change in orientation with each other upon handling and said assembly can be handled without deviations among the individual fibers.

13. A process for producing an assembly of metal-coated carbon fibers having a two-dimensional network structure or both a two-dimensional network structure and a three-dimensional network structure, which comprises coating carbon fibers with a matrix metal layer by ion plating or vacuum deposition, and point bonding the metal-coated carbon fibers by the metal, said bonding points being present to such an extent that individual carbon fibers do not substantially change in orientation with each other upon handling and said assembly can be handled without deviations among the individual fibers.

4,132,829

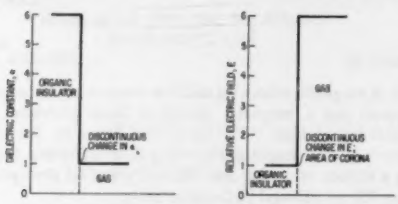
PREPARATION OF DIELECTRIC COATINGS OF VARIABLE DIELECTRIC CONSTANT BY PLASMA POLYMERIZATION

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Martin Hudis, Wauwatosa, Wis., and Theodore Wydeven, Sunnyvale, Calif.

Division of Ser. No. 589,172, Jun. 23, 1975, abandoned. This application Feb. 11, 1977, Ser. No. 767,912

Int. Cl.[2] B05D *3/06*

U.S. Cl. 428—411 **11 Claims**



1. A process for the production of a non-conductive substrate coated with a polymer coating that is deposited on said substrate from the monomeric state and is resistant to corona discharge, comprising

disposing a non-conductive substrate in a closed reactor between two temperature-controlled electrodes which are connected to a power supply,

maintaining a vacuum within the reactor,

establishing an atmosphere of monomer gas or monomer gas and diluent gas about the substrate,

generating a plasma between the electrodes, thereby polymerizing the monomer gas or the monomer gas and diluent and depositing the polymerized substance on the substrate, and

during the deposition, varying in one direction continuously or in stages at least one parameter selected from the group consisting of the gas partial pressures, the electric field strength and frequency and the current density, thereby producing a coated substrate wherein the coating is characterized by having a dielectric constant gradient, the variation in parameter being such as to initially produce on the substrate a polymeric stratum that has a dielectric constant closely approximating that of the substrate and to produce finally a surface stratum remote from the substrate that has a dielectric constant closely approximating that of the use environment.

4,132,830

NOBLE-METAL DENTAL ALLOY AND DENTAL METHOD

Min H. Tsai, Van Nuys, Calif., assignor to Unitek Corporation, Monrovia, Calif.

Continuation-in-part of Ser. No. 765,368, Feb. 2, 1977, abandoned. This application Dec. 27, 1977, Ser. No. 864,718

Int. Cl.[2] A61C *11/00;* **C22C** *5/02*

U.S. Cl. 428—450 **8 Claims**

1. A castable dental alloy suitable for bonding with dental porcelain and having a stable yellow-gold color which is retained after porcelain is fired on the cast alloy, comprising about 83–87 gold, 7–12% platinum, 1.5–3% Rhodium, less than about 1.0% copper, the ratio of rhodium to copper in the alloy being in the range of 3 to 15, and further elements for grain refining and formation of bonding oxides.

6. A method for making a dental restoration, comprising firing of a porcelain jacket on an alloy which includes 83–87% gold, 7–12% platinum, 1.5–3% rhodium, less than 1% copper, the ratio of rhodium to copper being in the range of 3 to 15, and further elements for grain refining and formation of bonding oxides.

4,132,831

LAMINATES HAVING A LINEAR, ACYLATED POLYALKYLENEPOLYAMINE INTERMEDIATE BINDING LAYER AND A METHOD OF PREPARATION

Yancey J. Dickert, Midland, and Anthony M. DeRoo, Sanford, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 7, 1977, Ser. No. 775,341

Int. Cl.[2] B32B *15/08, 27/06;* **C09J** *3/02*

U.S. Cl. 428—458 **27 Claims**

1. A method of preparing a laminate, the method comprising applying to a surface of a first substrate a binding amount of a linear, acylated polyalkylenepolyamine having a weight average molecular weight of at least about 10,000 as an intermediate binding layer and subsequently applying to the layer a surface of a second substrate.

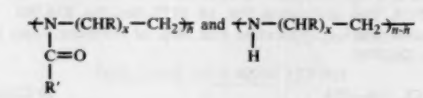
17. A laminate comprising:

(a) a first substrate;

(b) a second substrate; and

(c) a linear, acylated polyalkylenepolyamine having a weight average molecular weight of at least about 10,000 as an intermediate binding layer between the first and second substrates.

18. The laminate of claim 17 wherein the polyalkylenepolyamine consists essentially of n randomly joined units of the formulae



wherein R is hydrogen or C_1-C_3 alkyl; R′ is alkyl having up to about 18 carbon atoms or an inertly-substituted derivative thereof; x is 1 or 2; n is the total number of randomly joined units; h is the number of acylated units; and n–h is the number of deacylated units, with the proviso that h is at least 1.

4,132,832

METHOD OF APPLYING DISPERSIONS FOR ACTIVATING NON-CONDUCTORS FOR ELECTROLESS PLATING AND ARTICLE

Nathan Feldstein, 63 Hemlock Cir., Princeton, N.J. 08540

Continuation-in-part of Ser. No. 731,212, Oct. 12, 1976, which is a division of Ser. No. 607,506, Aug. 26, 1975, Pat. No. 3,993,799, which is a continuation-in-part of Ser. No. 512,224, Oct. 4, 1974, abandoned. This application Nov. 25, 1977, Ser. No. 854,909

Int. Cl.[2] **C23C** *3/02*

U.S. Cl. 428—462 **40 Claims**

1. A process for the preparation of non-conductor substrate prior to electroless plating which comprises contacting said substrate with a colloidal composition comprising a copper colloid admixed with nickel ions and wherein said admixing takes place post copper colloid nucleation.

4,132,833

DYE ELEMENT WITH A TRANSPARENT POLYESTER LAYER CONTAINING HEAT-TRANSFERABLE DYES

M. Akram Sandhu, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 730,884, Oct. 8, 1976, Pat. No. 4,097,230. This application Oct. 17, 1977, Ser. No. 842,837

Int. Cl.[2] **B32B** *27/10;* **G03F** *7/00*

U.S. Cl. 428—481 **18 Claims**

1. A dyed element comprising a substrate having thereon a transparent layer containing an amorphous, solvent soluble, aromatic polyester comprising at least 30 mole percent of its recurring units comprised of the condensation residue of aromatic diol having the general formula:

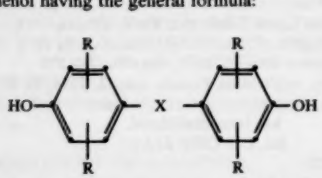
HO—AR—X—AR—OH

or the condensation residue of aromatic dicarboxylic acid having the general formula:

HOOC—AR—X—AR—COOH

wherein AR is an aromatic radical and X is a saturated gem-bivalent radical having a saturated polycyclic three-dimensional structure that includes a saturated bicyclic atomic bridged hydrocarbon ring member, said layer containing therein a heat-transferable dye.

8. A dyed element comprising a substrate having thereon a layer having a transparent, amorphous, solvent soluble, aromatic polyester comprising recurring units comprising the condensation residue of diol with carbonic acid or dicarboxylic acid, at least 30 mole percent of the diol being comprised of bisphenol having the general formula:



wherein R is hydrogen, halogen, or an alkyl group having from 1 to about 4 carbon atoms, and X is a saturated gem-bivalent radical having a saturated polycyclic three-dimensional structure that includes a saturated bicyclic atomic bridged hydrocarbon ring member; and at least 30 mole percent of said dicarboxylic acid being comprised of terephthalic acid, isophthalic acid, or a mixture thereof, said layer containing therein a heat-transferable dye.

4,132,834

DRY TONER ELECTROFAX PAPER

George L. Damico, Tyrone, Pa., assignor to Westvaco Corporation, New York, N.Y.

Filed Dec. 2, 1977, Ser. No. 856,859

Int. Cl.[2] **G03G** *5/08, 5/09;* **B32B** *29/06*

U.S. Cl. 428—511 **2 Claims**

1. Electrofax paper for use in a pressure fixed dry toner copier, prepared from a basestock that is substantially nonconductive as a result of the absence of any conductive material specifically for increasing its conductivity, and coated with a photoconductive zinc oxide coating that has a higher than normal conductivity to compensate for the relatively nonconductive nature of the basestock, wherein:

(a) the basestock has an evenly distributed moisture content greater than about 3.5% and is treated with an aqueous sizepress formulation comprising starch and pigment in an amount of from about 3–4 lb/ream to achieve a surface resistivity on the order of from about 10^9–10^{14} ohm per square; and,

(b) the basestock is overcoated on one side thereof with a resin system containing photoconductive zinc oxide coating having a surface resistivity less than about 10^{11} ohm per square in an amount of from about 12–25 lb/ream to produce a final zinc oxide coated paper having a surface resistivity in the range of from about 10^9–10^{11} ohm per square.

4,132,835

PRESSURE SENSITIVE MAGNETIC IMAGE TRANSFER MEDIA

Elbert Du, Cincinnati, Ohio, assignor to Frye Copysystems, Inc., Des Moines, Iowa

Filed Mar. 25, 1977, Ser. No. 781,116

Int. Cl.[2] **H01F** *1/28;* **B32B** *27/32*

U.S. Cl. 428—522 **1 Claim**

1. A pressure sensitive magnetic image transfer medium formed of

a planar flexible substrate film of synthetic resinous material

a transfer layer adherently secured to one surface of said substrate film and from which localized portions are selectively transferable to a copy surface in response to pressure application to the obverse surface of said substrate film

said transfer layer consisting essentially of the uniformly dispersed intermixture of about 40 to 45 parts each of a polyethylenic homopolymer and finely divided magnetic metal oxide, about 3 to 5 parts of an alkyd compatible acrylic ester resin and

about 6 to 10 parts of ethyl hydroxyl ethyl cellulose being mutually incompatible with the alkyd acrylic ester resin.

4,132,836

ALKALI METAL-HALOGEN CELL HAVING MIXED HALOGEN CATHODE

Wilson Greatbatch, Clarence, N.Y., assignor to Eleanor & Wilson Greatbatch Foundation, Akron, N.Y.

Filed Nov. 21, 1977, Ser. No. 853,108

Int. Cl.[2] **H01M** *6/18*

U.S. Cl. 429—91 **9 Claims**

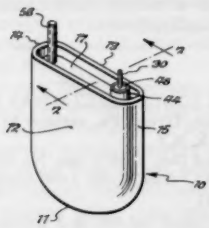
1. An alkali metal-halogen cell comprising:

(a) an alkali metal anode;

(b) a solid alkali metal-halogen electrolyte; and

(c) a cathode comprising a mixture of two halogens, one of

said halogens providing discharge of said cell at a first level of cell output voltage and the other of said halogens



providing discharge of said cell at a second level of cell output voltage.

4,132,837

ELECTROCHEMICAL CELLS WITH NON-AQUEOUS ELECTROLYTES CONTAINING MACROHETEROCYCLIC COMPOUNDS

Abraham Soffer, Arad, Israel, assignor to University Patents, Inc., Stamford, Conn.

Filed Mar. 30, 1978, Ser. No. 891,807

Int. Cl.[2] H01M 6/14

U.S. Cl. 429—194 **35 Claims**

1. An electrochemical cell comprising a light metal anode, a cathode and a non-aqueous electroyte comprising an aprotic organic solvent having dissolved therein an electrically conductive salt and a macroheterocyclic compound complexed with the cation moiety of the salt.

4,132,838

PROCESS AND APPARATUS FOR THE PREPARATION OF A REACTION MIXTURE FOR THE PRODUCTION OF PLASTIC FOAMS

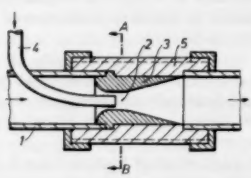
Karl D. Kreuer, and Klaus Schulte, both of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sep. 22, 1976, Ser. No. 725,600

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1975, 2544559

Int. Cl.[2] C08G 18/08, 18/14; B01J 1/00

U.S. Cl. 521—50 **3 Claims**



1. In a process for the preparation of a reaction mixture for the production of foam materials from at least two components comprising an active hydrogen containing material and a polyisocyanate, wherein at least two separate component streams are brought together and mixed, the improvement comprising passing at least one of the streams through a constriction at a predetermined velocity thereby producing a zone at a reduced pressure and feeding a gas into said reduced pressure zone and then passing the resulting combined stream into a zone having a cross-sectional area larger than the cross-sectional area of said reduced pressure zone before mixing the component streams.

4,132,839

BIODEGRADABLE HYDROPHILIC FOAMS AND METHOD

Nelson S. Marans, Silver Spring, and Alan R. Pollack, Baltimore, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 731,295, Oct. 12, 1976, Pat. No. 4,049,592, which is a continuation-in-part of Ser. No. 597,258, Jul. 18, 1975, abandoned. This application Sep. 16, 1977, Ser. No. 833,843

The portion of the term of this patent subsequent to Sep. 20, 1994, has been disclaimed.

Int. Cl.[2] C08G 18/42, 18/14

U.S. Cl. 521—159 **15 Claims**

1. An isocyanate-capped polyether polyol having an isocyanate functionality of at least 2, said polyol comprising a mixture, prior to capping, of (a) an essentially linear, hydroxy terminated polyether having a molecular weight not exceeding about 4,000 with (b) a reaction product formed by reacting an aliphatic alcohol having from 3 to 8 hydroxyl groups per mole and a molecular weight of less than about 1,000 with a monobasic hydroxy carboxylic acid containing up to 20 carbon atoms to esterify the hydroxyl groups of said aliphatic alcohol.

4,132,840

PROCESS FOR COLORING POLYURETHANE FOAMS

Herbert Hugl, and Gerhard Wolfrum, both of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

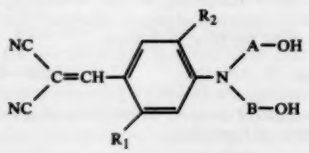
Filed Jul. 9, 1976, Ser. No. 703,855

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1975, 2530809

Int. Cl.[2] C08G 18/14, 18/38

U.S. Cl. 521—167 **2 Claims**

1. Colored polyurethane foam of very good light-fastness having incorporated therein with covalent bond formation 0.005 to 0.2% based on the polyol component of a dyestuff of the formula



wherein

R_1 is hydrogen, methyl, ethyl, methoxy, ethoxy, chlorine, bromine or acetylamino;

R_2 is hydrogen, methyl, ethyl, propyl, methoxy or ethoxy and;

A and B are ethylene, trimethylene or tetramethylene.

4,132,841

COPOLYMERS OF DYES AND ACRYLAMIDE

Michel M. L. Champenois, Le Mesnil Esnard, assignor to Produits Chimiques Ugine Kuhlmann, Paris, France

Continuation-in-part of Ser. No. 601,010, Aug. 1, 1975. This application Jan. 25, 1977, Ser. No. 762,372

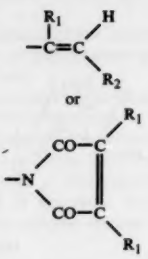
Claims priority, application France, Aug. 2, 1974, 74 26846

The portion of the term of this patent subsequent to Jun. 6, 1995, has been disclaimed.

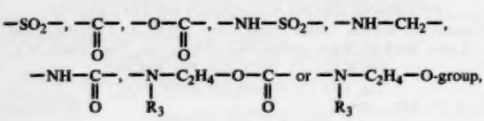
Int. Cl.[2] C08F 212/32

U.S. Cl. 526—221 **3 Claims**

1. A structurally dyed, water insoluble, macromolecular material containing in copolymerized form, acrylamide, at least one azo, anthraquinone, pyrazolanthrone or phthalocyanine dye having at least one group of the formula:



wherein R_1 is hydrogen or alkyl having 1 to 4 carbon atoms, R_2 is hydrogen, halogen, cyano, carboxy, carbonamido or alkoxycarbonyl with 1 to 4 carbons in the alkoxy chain, said groups being attached to a cyclic carbon atom of an aromatic nucleus of the dye molecule either directly or through an oxygen or sulfur atom or a



R_3 being hydrogen or alkyl with 1 to 4 carbon atoms, at least one colorless base monomer selected from the group consisting of:

styrene and its substituted derivatives,
divinylbenzene,
polybutadiene oligomers having vinyl groups,
acrylic, methacrylic, crotonic, chloroacrylic, maleic, and itaconic acids and their anhydrides, nitriles, esters, amides, N-monoalkyl amides and N-dialkylamides,
ethyleneglycol diacrylate,
methylene-bis-acrylamide and methylene-bis-methacrylamide,
vinyl esters of saturated carboxylic acids,
vinyl halides and vinylidene halides,
vinylpyridines, vinylpyrrolidines, vinylquinolines, and
N-vinyl-imidazole, N-vinyl-carbazole, N-vinyl-pyrolidones of N-vinyl-caprolactam, obtained by first copolymerizing for 30 seconds to 5 minutes, in an aqueous medium and at a temperature from 0° C. to 100° C., in the presence of a tetravalent cerium complex as initiator, the dye with the acrylamide to form a reactive prepolymer, and then reacting in situ said prepolymers with the base monomer and the remaining free dye and acrylamide, the amount of dye being from 0.1 to 25% by weight of the base monomer and the amount of acrylamide being from 0.5 to 50% by weight of the base monomer.

4,132,842

SILICON-PHTHALOCYANINE-SILOXANE POLYMERS

Kenneth J. Wynne, Falls Church, Va., and John B. Davison, Amherst, N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 23, 1978, Ser. No. 880,514
Int. Cl.[2] C08G *77/04*
U.S. Cl. 528—33 **5 Claims**

1. A silicon-phthalocyanine siloxane polymer having the formula:

$$(PcSiOSiR'Ph(OSiR''_2)_n\ OSiR'PhO)_x$$

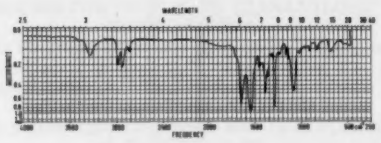
wherein Pc is a phthalocyanine nucleus, Ph is a phenyl group, n is an integer from 1 to 8, R′ and R″ as alkyls having from 1 to 8 carbon atoms, and x is from 1 to 20.

4,132,843

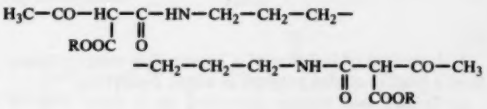
BLOCKED POLYISOCYANATES FORMED FROM HEXAMETHYLENE-1,6-DIISOCYANATE AND ACETOACETIC ACID C_3-C_5 ALKYL ESTERS

Horst Dalibor, Norderstedt, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 18, 1977, Ser. No. 779,234
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1976, 2612784
Int. Cl.[2] C08G *18/80, 18/73*
U.S. Cl. 528—45 **4 Claims**

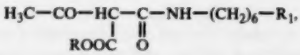


1. Process for the manufacture of a blocked diisocyanate of the formula



wherein R denotes an n-propyl, isopropyl, n-butyl, tert.-butyl, isobutyl, sec.-butyl or pentyl radical, characterised in that an acetoacetic acid alkyl ester in which the alkyl radical is R, is reacted with hexamethylene-1,6-diisocyanate in a molar ratio of 2.0 to 2.1:1, by warming in the presence of a catalyst.

4. Method which comprises crosslinking polymers containing hydroxy groups with a blocked diisocyanate of the formula



wherein R_1 donates the radical

n-propyl, isopropyl, n-butyl, tert.-butyl, isobutyl, sec.-butyl, or pentyl radical at a temperature of 80 to 130° C.

4,132,844

TREATMENT OF ACRYLAMIDE POLYMER GEL

Michael W. C. Coville, Bingley, England, assignor to American Cyanamid Company, Stamford, Conn.

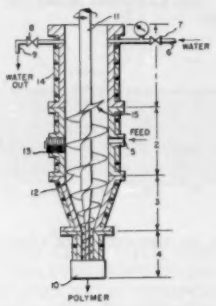
Filed May 23, 1977, Ser. No. 799,895
Int. Cl.[2] C08F *6/10*
U.S. Cl. 528—499 **8 Claims**

1. A method for the reduction of the amount of water insolubles and free monomer in an aqueous acrylamide polymer gel charge containing at least about 25% polymer and having a molecular weight of at least about 4 million which comprises heating said polymer gel, in the substantial absence of a sulfite compound, at a temperature ranging from about 80° C. to about 150° C. for at least about 30 minutes while simultaneously maintaining the water content of the gel undergoing heating at substantially the concentration of that of said charge and recovering the resultant polymer gel.

4,132,845
MECHANICAL DEWATERING PROCESS FOR ELASTOMER SLURRIES

Robert A. Covington, Jr., and Okan M. Ekiner, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 27, 1977, Ser. No. 801,370
Int. Cl.[2] C08F *6/22, 6/24*
U.S. Cl. 528—499 11 Claims



1. A method of isolation of a heavier-than-water polymer from a mixture of said polymer in water, comprising:

(a) feeding said mixture containing up to about 90% by weight water through an inlet feedport into a vertically disposed separator, the separator being comprised of:

(1) an upper settling section;

(2) a cylindrical feed section located below said settling section;

(3) a conical compression section located below said feed section; tapering into

(4) a bottom cylindrical metering section having a discharge port and a valve at its bottom end,

said separator containing a rotating screw having helical flights extending from the bottom end of the metering section upwards through the compression section and through the feed section, said settling section also having near its upper end an inlet port for introducing excess water under pressure and a valved water discharge port for controlling the water pressure in the settling section, the settling section having sufficient length above said screw flights to permit gravitational separation of said polymer and water in the settling and feed sections; and

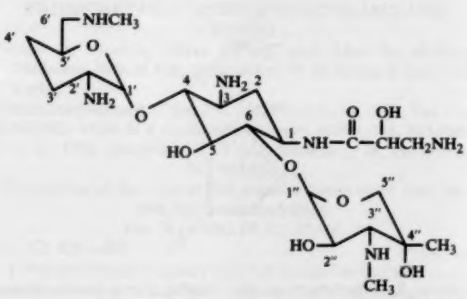
(b) introducing excess water under pressure into the settling section such that said mixture is separated into concentrated polymer containing less than about 10% by weight total volatiles discharging from said bottom metering section and feed water and excess water discharging from said discharge port.

4,132,846
1-N-(α-HYDROXY-β-AMINOPROPIONYL) XK-62-2 AND METHOD OF PRODUCTION THEREOF

Shinji Tomioka, Machida; Yasuki Mori, Kawasaki, both of Japan, and Kunikatsu Shirahata, Columbus, Ohio, assignors to Abbott Laboratories, North Chicago, Ill.

Continuation of Ser. No. 556,223, Mar. 7, 1975, abandoned. This application Mar. 8, 1977, Ser. No. 775,463
Claims priority, application Japan, Mar. 7, 1974, 49-25753
Int. Cl.[2] C07H *15/22*
U.S. Cl. 536—17 1 Claim

1. A compound having the formula:



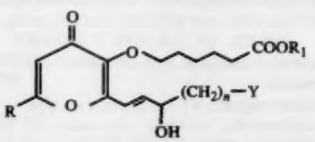
or a non-toxic pharmaceutically acceptable acid addition salt thereof.

4,132,847
4-PYRONE PROSTAGLANDIN ANTAGONISTS

Donald E. Kuhla, Gales Ferry, and Jacob J. Plattner, East Lyme, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Jul. 22, 1977, Ser. No. 818,043
Int. Cl.[2] C07D *309/22;* A61K *31/35*
U.S. Cl. 542—441 12 Claims

1. A compound of the formula



wherein

R_1 is hydrogen or alkyl of 1 to 6 carbon atoms;

R is selected from hydrogen, methyl, ethyl, n-propyl and 1-hydroxyalkyl, wherein said alkyl is methyl, ethyl and n-propyl;

Y is selected from methyl, phenyl and monosubstituted phenyl, wherein said substituent is methyl, methoxy, chloro or fluoro; and

n is an integer from 1 to 4;

and the pharmaceutically acceptable salts of said compounds wherein R_1 is hydrogen.

4,132,848
METHOD OF PREPARING A RAPIDLY DISSOLVING POWDER OF CRYSTALLINE CEPHALOTHIN SODIUM FOR PARENTERAL ADMINISTRATION

Michael D. Cise, and Michael L. Roy, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 3, 1977, Ser. No. 847,501
Int. Cl.[2] C07D *501/02*
U.S. Cl. 544—28 18 Claims

1. A method of preparing essentially crystalline cephalothin sodium for reconstitution for parenteral administration by a freeze-drying process requiring less than 24 hours comprising the steps of:

(a) dissolving said cephalothin sodium in a solvent comprised of from about 2 to about 10 percent of a C_1–C_3 alcohol or acetone and from about 98 to about 90 percent water (v/v);

(b) cooling the solution from (a) to about −20° C. or below;

(c) warming the preparation from (b) to a temperature of between about −3° C. and about −10° C.;

(d) maintaining the temperature of the preparation from (c) at from about −3° C. to about −10° C. for a period of 3 hours or more;

(e) cooling the preparation from (d) to about −20° C., or below;
(f) reducing the pressure of the environment in which the preparation from (e) is maintained to a maximum of 1 mm of mercury absolute;
(g) raising the temperature of the environment in which the preparation from (f) is maintained to a maximum of 50° C., avoiding the melting of such preparation; and
(h) subliming the solvent from the preparation from (g) until the resulting crystals of said cephalothin sodium have a moisture content of not more than 1.0 percent, and a $C_1 \propto C_3$ alcohol or acetone content of not more than 1.0 percent.

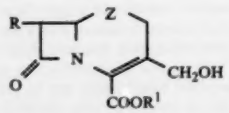
4,132,849

PROCESS FOR THE PREPARATION OF 3-HYDROXYMETHYL CEPHALOSPORINS

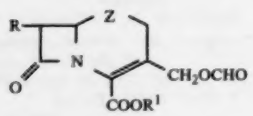
Barry E. Ayres, Ickenham, England, assignor to Glaxo Laboratories Limited, Greenford, England

Filed Oct. 7, 1977, Ser. No. 840,249
Claims priority, application United Kingdom, Oct. 8, 1976, 42023/76
Int. Cl.² C07D *501/04*
U.S. Cl. 544—28 **9 Claims**

1. A process for the preparation of a compound of the formula



wherein Z is > S or > S→O, R is a blocked amino group and R^1 is a carboxyl blocking group, which comprises selectively hydrolysing under acidic conditions in the presence of a protic solvent selected from the group consisting of water and a lower alkanol, a compound of the formula



wherein Z, R and R^1 have the meanings given above.

4,132,850

TRI-SUBSTITUTED TRIAZINES

Ransom B. Conrow, Pearl River, and Seymour Bernstein, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jun. 29, 1977, Ser. No. 811,101
Int. Cl.² C07D *251/70*
U.S. Cl. 544—196 **1 Claim**

1. The compound, (s-triazine-2,4,6-triyltrinitrilo)hexaacetic acid.

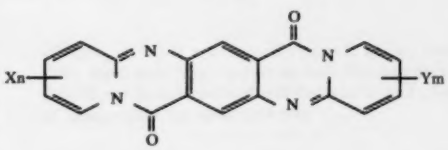
4,132,851

PROCESS FOR PRODUCING QUINAZOLONE DERIVATIVES

Yasukazu Yokoyama, Tokyo, and Eiji Iwamoto, Yamato, both of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

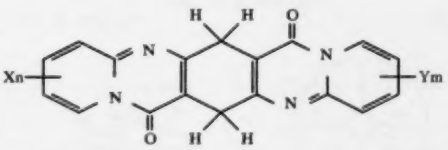
Filed Mar. 3, 1977, Ser. No. 774,048
Claims priority, application Japan, Mar. 16, 1976, 51/27718
Int. Cl.² C07D *471/22*
U.S. Cl. 544—245 **11 Claims**

1. A process for producing a 7,15-dihydropyrido[2,1-b]pyrido[1',2':1,2]pyrimido[4,5-g]quinazoline-7,15-dione having the formula



(I)

wherein X and Y are each independently selected from the group consisting of C_1–C_3 alkyl, C_1–C_3 alkoxyl and halogen, and n and m respectively represent 0, 1 or 2; which comprises the step of oxidizing a 6,7,14,15-tetrahydropyrido[2,1-b]pyrido[1',2':1,2]pyrimido[4,5-g]quinazoline-7,15-dione having the formula



(II)

wherein X, Y, n and m are as defined above, with a quinone in an acidic liquid medium selected from the group consisting of concentrated sulfuric acid, glacial acetic acid, aqueous sulfuric acid, aqueous hydrochloric acid and aqueous acetic acid.

4,132,852

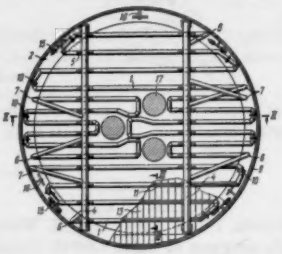
COOLED ROOF OF ELECTRIC FURNACE

Sergei M. Andoniev, prospekt Pravdy, 5, Kv. 60; Lev D. Gritsuk, ulitsa Kombainovskaya, 13, Kv. 3; Anatoly S. Gorbik, prospekt Lenina, 24, Kv. 31, all of Kharkov; Viktor V. Kurganov, ulitsa 40 let Sovetskoi Ukrainy, 11, Kv. 5, Zaporozhie; Nikolai P. Oleinik, ulitsa Matrosova, 6a, Kv. 58; Grigory I. Rivlin, ulitsa Krasnoznamennaya, 7/9, Kv. 79, both of Kharkov; Nikolai V. Stetsenko, ulitsa Patrioticheskaya, 32, Kv. 34, Zaporozhie; Jury P. Shamil, prospekt Lenina, 232, Kv. 47, Zaporozhie; Jury G. Smetanin, bulvar Gvardeisky, 136a, Kv. 11, Zaporozhie, and Petr S. Nesterenko, ulitsa Mayakovskogo, 3, Kv. 15, Zaporozhie, all of U.S.S.R.

Filed Dec. 16, 1977, Ser. No. 861,503

Int. Cl.[2] F27D *1/02, 1/12*

U.S. Cl. 13—32 **1 Claim**



1. A cooled roof for an electric furnace, comprising: a roof ring having a space for the passage of a coolant; beams-headers resting on said roof ring; a framework formed by loop-shaped tubes coupled with and running transversely to said beams-headers, from which they are suspended and fixed at one end on said roof ring; metal straps, of which each one is secured to the top generatrix of the tube of said framework; a refractory lining made up of bricks placed at least in one layer in rows so that in each row the brick are resting with their end parts on the adjacent tubes of said framework and are arranged with a clearance sufficient for their thermal expansion when heated between said metal straps welded edgewisely to the top generatrices of said framework tubes.

4,132,853

ELECTRICAL BUSHING

Loren B. Wagenaar, Muncie, Ind., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 25, 1977, Ser. No. 790,225

Int. Cl.[2] H01B *17/26*

U.S. Cl. 174—12 BH **7 Claims**

1. An electrical insulating bushing comprising:

a hollow electrical conductor having inner and outer surfaces and first and second ends;

a first longitudinally extending member surrounding and radially spaced from said conductor and defining a first longitudinally extending annular channel between said outer surface of said conductor and said first member, said first longitudinally extending member being formed of electrical insulating material;

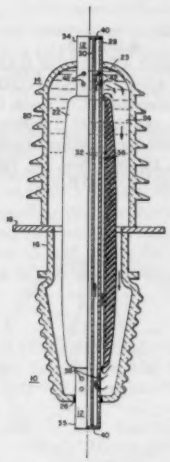
a second longitudinally extending member concentrically disposed within and radially spaced from said conductor and defining a second longitudinally extending annular channel between said inner surface of said conductor and said second member;

an electrical insulating housing surrounding and spaced from said first member and defining a longitudinally extending third channel therebetween; and

dielectric fluid filling said housing to a predetermined level;

said first and second channels being disposed in fluid flow communication with said third channel at opposite ends of said electrical conductor such that said dielectric fluid will flow in parallel through said first and second channels and thereby remove heat from said inner and outer surfaces of said conductor, respectively,

which heat is dissipated to the ambient air through said housing as said dielectric fluid flows through said third



channel, said first and second channels having substantially equal fluid flow resistances such that said dielectric fluid flows through both of said first and second channels at substantially the same flow rate.

4,132,854

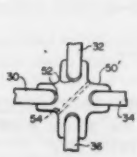
MULTIPLE CONDUCTOR GAS INSULATED TRANSMISSION LINE

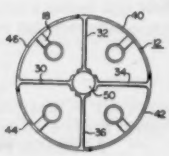
George A. Kemeny, Sudbury, and Alan H. Cookson, Southborough, both of Mass., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 29, 1977, Ser. No. 828,470

Int. Cl.[2] H01B *11/00*

U.S. Cl. 174—27 **6 Claims**





1. A multiple conductor, high-voltage gas-insulated transmission line comprising:

an elongated, cylindrical outer sheath at low electrical potential;

a plurality of elongated inner conductors at high electrical potential with respect to said outer sheath disposed within said outer sheath;

a pressurized insulating gas electrically insulating said inner conductors from said outer sheath;

means for insulatably supporting said inner conductors within said outer sheath; and,

means disposed within, and extending longitudinally along said outer sheath for electrically isolating each of said inner conductors from each other inner conductor, said isolation means comprising a single-piece metallic wall, at the same electrical potential as said outer sheath, extending between each pair of adjacent inner conductors, said outer sheath comprising a plurality of sheath sectors secured together, said metallic walls being extruded with said sheath sectors, said outer sheath being circular in

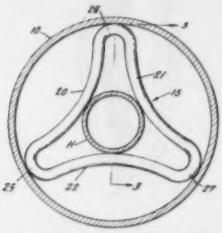
cross-section about a longitudinal axis, a joining member of a compressible material being disposed along said outer sheath longitudinal axis, and said metallic walls extending from said sheath sectors to said joining member.

4,132,855

SUPPORT INSULATOR FOR GAS-FILLED HIGH-VOLTAGE TRANSMISSION LINE

Robert M. Clark, Ligonier; John C. Cronin, Greensburg; David H. Reighter, Roslyn, and Vasu H. Tahiliani, Jeannette, all of Pa., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Feb. 14, 1977, Ser. No. 768,391
Int. Cl.[2] H01B *9/04*
U.S. Cl. 174—28 **14 Claims**



1. An insulator support for a gas-insulated transmission line; said gas-insulated transmission line comprising an elongated central conductor suspended within and along the axis of an elongated gas-filled outer housing; said insulator support comprising a generally triangularly shaped molded insulation member having three legs in a common plane and joined together at three respective apices; each of said three legs being generally inwardly bowed toward the center of said triangular shape; said inwardly bowed legs being adapted to engage and support said central conductor of a gas-insulated transmission line; each of said three apices being adapted to engage the inner diameter of said outer housing of said gas-insulated transmission line; each of said three legs being identical to one another; each of said three legs having a constant cross-sectional configuration for substantially their full lengths.

4,132,856

PROCESS OF FORMING A PLASTIC ENCAPSULATED MOLDED FILM CARRIER CML PACKAGE AND THE PACKAGE FORMED THEREBY

Robert V. Hutchison, Valley Center, and John A. Nelson, San Diego, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Nov. 28, 1977, Ser. No. 855,286
Int. Cl.[2] H05K *5/06*
U.S. Cl. 174—52 PE **15 Claims**

9. A plastic encapsulated package for an integrated circuit comprising:

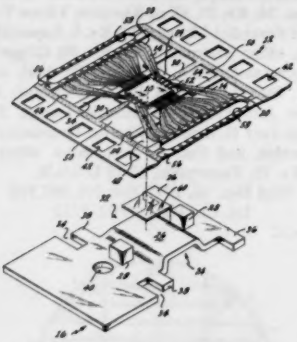
a metallic heat sink having an upper surface provided with a die attach area for receiving an integrated circuit thereon and spacing said integrated circuit from said upper surface,

a pattern of connector leads running outwardly from said die attach area and forming connector pads, said pattern of leads being held in a film carrier,

means for interconnecting individual connector leads of said pattern with said integrated circuit,

means for interconnecting said integrated circuit with said heat sink to provide a common ground therebetween electrically insulated from said other individual connector leads, and

means for encapsulating said integrated circuit and a major portion of said heat sink as well as a portion of said connector leads in plastic leaving only the ends free of said



plastic for connecting said integrated circuit to other electronic devices.

4,132,857

ELECTRICAL CABLE

Leonard S. Scarola, Union, and Charles E. White, Plainfield, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed Aug. 12, 1971, Ser. No. 171,358
Int. Cl.[2] H01B *7/18;* B32B *7/02, 15/18*
U.S. Cl. 174—107 **1 Claim**

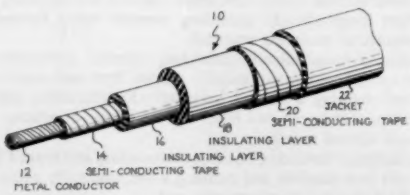
1. An electrical cable consisting essentially of a conductor core, a metal cable sheathing surrounding said conductor core, a coextruded dual film laminate around said metal cable sheathing and an exterior polyethylene jacketing, said electrical cable having improved adhesion of the polyethylene jacket to the metal sheath with said polyethylene jacket adhered to said sheath by means of the coextruded dual film laminate of (I) a film layer of polyethylene and (II) a film layer of an ethylene/acrylic acid copolymer, said cable sheathing and jacketing surrounding said electrical conductor with said film layer (II) next to the metal sheath and said film layer (I) next to the polyethylene jacket.

4,132,858

GRADED INSULATION CABLE CONSTRUCTION, AND METHOD OF OVERCOMING STRESSES THEREIN

Harry C. Anderson, Stratford; Burton T. MacKenzie, Jr., Monroe; Maurice Prober, Fairfield, all of Conn., and Nirmal Singh, Lenox, Mass., assignors to General Electric Company, New York, N.Y.

Continuation-in-part of Ser. No. 643,931, Dec. 23, 1975, abandoned. This application Mar. 28, 1977, Ser. No. 781,888
Int. Cl.[2] H01B *7/02*
U.S. Cl. 174—120 SR **24 Claims**



1. An electrical cable for high voltage service having a multi-layered, graded insulation which minimizes uneven electrical stresses at the interface of insulation gradations, comprising an elongated metal electrical conductor enclosed within a surrounding composite body of polymeric insulation consisting

of at least two distinct contiguous of polymeric insulation having different specific inductive capacitance values arranged about the electrical conductor with the innermost layer of polymeric insulation of the composite body of the insulation surrounding the electrical conductor having the highest specific inductive capacitance and each outwardly successive layer of polymeric insulation of the composite body of insulation having a progressively decreased specific inductive capacitance value, the specific inductive capacitance value of the innermost layer of polymeric insulation having the highest specific inductive capacitance surrounding the electrical conductor being about 3.2 to about 3.8 and the specific inductive capacitance value of the contiguous layer adjacent thereto being about 2.2 to about 3.0 and said specific inductive capacitance values being within a ratio of less than 1.4.

4,132,859

SOUND REPRODUCING APPARATUS

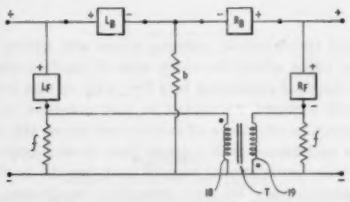
Egils Ranga, 76 Nibshaw La., Gomersal, Cleckheaton, W. Yorkshire, England

Claims priority, application United Kingdom, Dec. 4, 1976, 50639/76

Filed Dec. 2, 1977, Ser. No. 856,972

Int. Cl.[2] H04R *5/00*

U.S. Cl. 179—1 GQ **17 Claims**



1. A pair of loudspeakers for use as the front loudspeaker pair of a surround-sound reproduction system, one of the loudspeakers being connected in series with one winding of a transformer and the other of the loudspeakers being connected in series with another winding of the transformer, the windings being electrically connected asymmetrically.

4,132,860

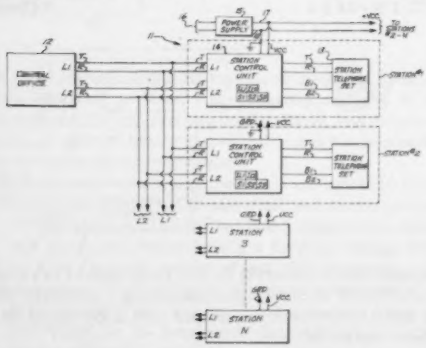
HOLD CONTROL FOR A KEY TELEPHONE SYSTEM

Harry R. Rasmussen, Tacoma, Wash., assignor to Crest Industries, Inc., Puyallup, Wash.

Filed Aug. 1, 1977, Ser. No. 820,785

Int. Cl.[2] H04M *1/00*

U.S. Cl. 179—99 **24 Claims**



1. A hold control circuit for a telephone system of the type that includes a telephone line extending to a telephone set which has an internal line terminating impedance, and which produces a signal on such line that signals an off-hook condition by connecting said internal line terminating impedance across the line when the telephone set is off-hook, and which produces a signal on such line that signals an on-hook condition by disconnecting said internal line terminating impedance from across the line when said telephone set is on-hook, said circuit comprising:

hold condition line terminating impedance means that when connected across said line simulates an off-hook condition on said line even though the internal line terminating impedance of the telephone set is disconnected from the line;

means for connecting said hold condition line terminating impedance means across the line;

means for varying said hold condition line terminating impedance means to cause a varying voltage signal to appear on the line signalling that the line is in a hold condition;

means for sensing said varying voltage signal; and

means responsive to said means for sensing for indicating that the line is in said hold condition.

4,132,861

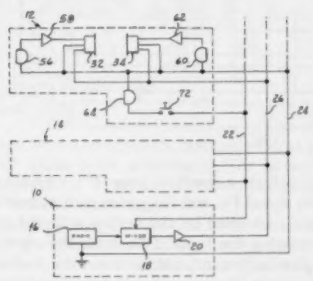
HEADSET HAVING DOUBLE-COIL EARPHONE

Leonard P. Frieder, Jr., Dalton, and Benjamin T. Cochran, Clarks Summit, both of Pa., assignors to Gentex Corporation, Carbondale, Pa.

Filed Jul. 27, 1977, Ser. No. 819,252

Int. Cl.[2] H04M *1/19*

U.S. Cl. 179—1 P **5 Claims**



1. A headset for use in a voice communication system having a common audio signal, comprising:

an earphone having two voice coils and a magnet assembly common to said voice coils;

means for supporting the earphone against the head of a wearer in acoustical communication with the ear;

a microphone;

means for supporting the microphone on the head of the wearer in acoustical communication with the surrounding environment;

means for coupling the microphone to one of the voice coils; and

means for coupling the common audio signal to the other of the voice coils.

4,132,862

DEVICE FOR THE DIGITAL MULTIPLEXING OF QUASI-SYNCHRONOUS TRAINS

François Ferret, Longjumeau; Pierre Doussoux, Paris, and Yvon Le Nen, St Germain les Arpajon, all of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Dec. 5, 1977, Ser. No. 857,842

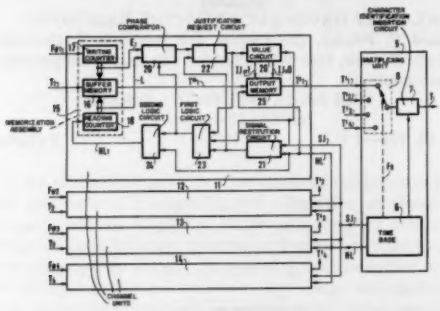
Claims priority, application France, Dec. 3, 1976, 76 36514

Int. Cl.[2] H04J *3/06*

U.S. Cl. 179—15 AF **6 Claims**

1. A device for multiplexing n quasi-synchronous digital trains, called incoming trains Ti, having the same nominal rate Fe and with real rates Fei ($1 \leqq i \leqq n$) into an outgoing multiplex

train with a nominal rate Fs slightly faster than n times the nominal rate of each incoming train, the outgoing train being arranged in successive frames each comprising, at defined locations, a given identification character CI, at least one n-bit justification indication IJ and a possible justification J having at the most one bit per incident train, the device comprising n channel units and one multiplexing unit: the multiplexing unit comprising a time base generating a signal at the frequency Fs of the bits of the outgoing train, a signal HL at the frequency Fs/n and having holes at the locations corresponding to the identification character CI and to each justification indication in each frame, this signal HL being transmitted by a first connection of the multiplexing unit to each channel unit; and each channel unit intended to generate a synchronized train T'i supplying the multiplexing unit via a second connection, and comprising a memorizing assembly for the incoming train, controlled for writing by the clock signal of this train, those frequency is Fei and for reading by a reading signal HL_1 deduced from the signal HL which is supplied by the multiplex-



ing unit, to deliver a resulting train T''i, a phase comparator between the signal Fei and HL_1, a request circuit for possible justifications controlled by the comparator and an inhibition circuit generating the signal HL_1 from the signal HL when there is a justification request, wherein the multiplexing unit also supplies each channel unit, via a third connection, with a signal SJ constituted by a clock pulse of Fs/n corresponding to each justification indication IJ, the pulse corresponding to the last justification IJ of each frame being maintained until the identification character CI of the following frame and wherein each channel unit also comprises a circuit for the restitution of the frame frequency from the signals SJ and HL, a circuit for controlling the inhibition circuit from the signal at the frame frequency, from the signal SJ and from the justification request signal, a circuit for copying the resulting train T''i delivered by the memorization and restitution assembly for the train T'i, controlled by the signal HL and associated with a circuit for inserting the value of each justification indication IJ at the location provided under the control of the signal SJ and of the output signal of the justification request circuit.

4,132,863

AUTOMATIC GAIN AND RETURN LOSS COMPENSATING LINE CIRCUIT

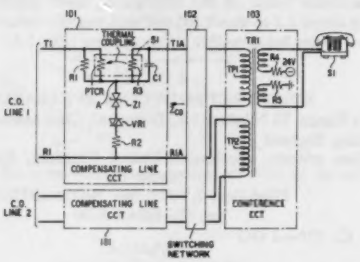
Douglas C. Smith, Rumson, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 20, 1977, Ser. No. 862,577
Int. Cl.[2] H04M 1/76
U.S. Cl. 179—16 F **21 Claims**

1. In a telephone switching system having a plurality of subscriber telephone circuits, each said subscriber circuit connected by a dc isolation device to an individual wire pair loop, said loops of differing length, a transmission loss compensation circuit interposed between each said loop and each said dc isolation devices, said compensation circuit comprising,

a first two-terminal resistive series arm with a first terminal connected to a first terminal of a dc isolating device and a second terminal connected to a common node,

a two-terminal transmission loss compensating shunt arm with a first terminal connected to both a second terminal of said dc isolating device and a second wire of said loop and where said second terminal of said shunt arm is connected to said common node, said shunt arm containing a voltage sensitive switching means for connecting a nonlinear resistance between said first and second terminal of said shunt arm when dc voltage across said shunt arm exceeds a predetermined value,



a second two-terminal resistive series arm having a resistance value which increases with dc current and with a first terminal connected to a first wire of said loop and a second terminal connected to said common node, said increases in resistance of said second series arm resulting from an increase in dc current flow in said loop which is inversely proportional to said loop lengths so that loop impedance seen by said subscriber equipment remains nearly constant, and wherein

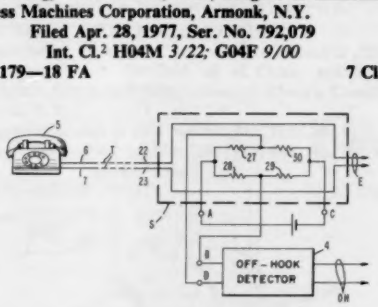
said shunt arm voltage sensitive switching means operates to adjust its resistance to compensate for resistance changes in said second series arm so as to maintain a constant transmission level to said subscriber equipment.

4,132,864

DIGITAL MEASUREMENT OF THE DC VALUE IN AN AC SIGNAL ADAPTED TO TELEPHONE OFF-HOOK DETECTION

Joseph S. Feng, White Plains, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 28, 1977, Ser. No. 792,079
Int. Cl.[2] H04M 3/22; G04F 9/00
U.S. Cl. 179—18 FA **7 Claims**



1. Apparatus for measuring the DC component of an electrical waveform of an input signal comprising a symmetric sine wave signal intermittently combined with a DC signal on a telephone line including

means for coupling to said telephone line to detect said input signal and providing a measured value in response thereto;

means for generating pulses of a reference signal having a relatively high frequency as compared with the frequency of said sine wave of said electrical waveform,

means for comparing said measured value with said refer-

ence signal to indicate the value of said DC component with respect to said reference signal,

said means for comparing having a counter and a plurality of inputs,

said counter having inputs and an output,

said means for coupling operating a gate at a said input of said means for comparing connected to an input of said counter,

said gate being operated as a function of the voltage of said input signal to pass counting pulses of said reference signal to said counter,

said means for comparing including means for providing a control signal at the end of a predetermined time for ending the counting by said counter of a given sequence of pulses, and

means for measuring the count of reference frequency pulses passed to said means for comparing in said counter during a single positive portion of a wave of said input signal to measure the numerator of the duty cycle of said input signal relative to a predetermined value for detecting the presence of a DC value in said input signal.

4,132,865

ELECTRONIC SWITCH

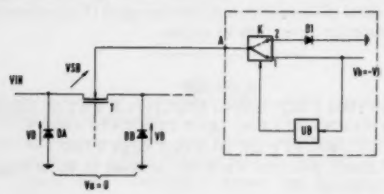
Kálmán Széchényi, Stuttgart, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Sep. 29, 1977, Ser. No. 837,672

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1976, 2644402

Int. Cl.[2] **H04Q** *3/50;* **H03K** *17/60;* **H01L** *27/02*

U.S. Cl. 179—18 GF **12 Claims**



6. In a telephone switching system, an integrated switching matrix including a plurality of switching elements in said switching matrix with one monitoring circuit, one switch and one diode assigned jointly to said matrix and wherein each of said switching elements comprises:

MOS transistor means, including drain and source terminals;

first potential connected to said drain and source terminals via first and second protective diodes respectively, each of said protective diodes having a forward voltage lower than the threshold voltage of said MOS transistor;

switch means for connecting the substrate terminal of said MOS transistor to a second potential through a first output of said switch means such that said first potential is greater than said second potential;

monitoring circuit means for controlling said switch means when said first and second potentials become equal such that said substrate is connected to zero potential through a second output of said switch means, said zero potential path including a diode.

4,132,866

CONCENTRATION NETWORK FOR A TIME DIVISION MULTIPLEX TELEPHONE EXCHANGE WITH PULSE AMPLITUDE MODULATION

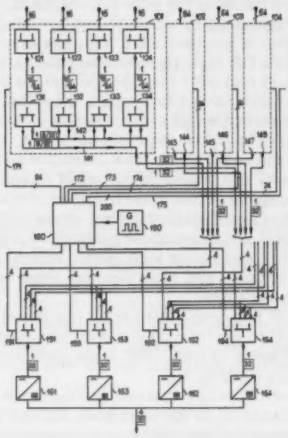
Jean-Pierre G. Coutard, Courbevoie, and Jean A. Picandet, Paris, both of France, assignors to Jeumont-Schneider, Puteaux, France

Filed Dec. 13, 1977, Ser. No. 860,079

Claims priority, application France, Dec. 29, 1976, 76 39430

Int. Cl.[2] **H04Q** *11/04;* **H04J** *3/00*

U.S. Cl. 179—15 AQ **1 Claim**



1. A network for a time-division, multiplex-frame telephone exchange with pulse code modulation, the network being utilized to connect 2^{n+p+q} subscriber's lines (n,p,q integers) to a plurality of coders, comprising:

(a) 2^{p+q} first multiplexers, each of said multiplexers having 2^n inputs respectively connected to the lines of 2^n subscribers;

(b) 2^{p+q} demultiplexers, each of said demultiplexers having an input, and odd and even outputs, each of said inputs being connected to a respective output of each of said first multiplexers;

(c) two pairs of second multiplexers having 2^q inputs and each of said second multiplexers having an output connected to a different one of said plurality of coders;

(d) 2^q first buses, each of said buses connecting the odd outputs of a group of 2^p demultiplexers to respective inputs of the first of said pairs of said second multiplexers;

(e) 2^q second buses, each of said buses connecting the even outputs of a group of 2^p demultiplexers to respective inputs of the second of said pairs of said second multiplexers;

(f) different matching resistors connected between ground and respective additional inputs of each first and second multiplexers and said demultiplexers; and

(g) cyclic control means, having a predetermined cyclic duration equal to the duration of a multiplex-frame, for controlling said first and second multiplexers, said demultiplexers, and said plurality of coders, and the transmission of signals between them, wherein said cyclic control means receives operating instructions from said telephone exchange and comprises:

(1) four coders, each coder comprising:

cyclic storing means having a number of positions equivalent to the number of time slots in one of said multiplex-frames, wherein each position contains n+p+q bits, for storing the addresses of subscriber's lines to be connected to said coder, said cyclic storing means having a store cycle of the same duration of said multiplex-frame; and

code converting means for converting p+q bits of each address into a one-out-of-2^{p+q} code for selecting one of

said first multiplexers, and q bits being used to select one of the 2^q inputs of said second multiplexers respectively connected to said coder;

(2) a plurality of groups of four logic circuit means, each of said groups being connected to a separate one of said 2^{p+q} first multiplexers, each of said groups of four logic circuit means respectively corresponding to said four cyclic storing means, each of said logic circuit means comprising n AND logic elements, each AND logic element having two inputs with n first inputs being connected to one output of said code converting means connected to its respective cyclic storing means and wherein n second inputs are placed in the same logic states as the n address bits corresponding to said respective cyclic storing means;

(3) a plurality of groups of n OR logic elements, each of said groups of n OR logic elements being connected to a separate one of said 2^{p+q} first multiplexers, each of said OR logic elements having four inputs, the n first inputs being respectively connected to the n outputs of said AND logic elements of said first logic circuit means, the n second inputs being connected to the n outputs of said AND logic elements of said second logic circuit means, the n third inputs being connected to the n outputs of said AND logic elements of said third logic circuit means, and the n fourth inputs being connected to the n outputs of said AND logic elements of said fourth logic circuit means, whereby the outputs of said n OR logic elements select one output of 2^n subscriber's lines;

(4) a first OR binary operator having two inputs respectively connected to the same code converting means outputs as the first inputs of said AND logic elements of said first logic circuit means; and

(5) a second OR binary operator having two inputs respectively connected to the same code converting means, as the first inputs of the AND logic elements of the third and fourth logic circuit means, wherein the outputs of said first and second OR binary operators select the odd and even outputs respectively of the respective 2^{p+q} demultiplexers, and wherein said cyclic control means connects each of said demultiplexers to their said additional input whenever the demultiplexer is not closed on one of its even or odd outputs; and connects each of said first and second multiplexers to their said additional input whenever said multiplexers do not have to be connected to a subscriber's line.

4,132,867

PROCESS FOR THE FRAME SYNCHRONIZATION OF A TIME DIVISION MULTIPLEX SYSTEM

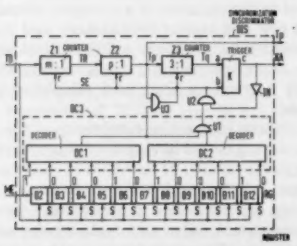
Joachim Siglow, Wolfratshausen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 28, 1977, Ser. No. 837,184

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1976, 2657365

Int. Cl.[2] H04J 3/06

U.S. Cl. 179—15 BS **4 Claims**



1. Process for the frame synchronization of a time division multiplex system comprising a plurality of data channels; with a multiplexer which, in respect of each t.d.m. frame makes available a total of m time slots and emits a multiplex signal; with a transmitting-end synchronizing bit generator which produces synchronizing bits which are transmitted in the frame of the multiplex signal from the transmitting-end to the receiving-end; with a receiving-end pulse generator for the production of a bit pulse train; with a receiving-end address generator for the operation of a demultiplexer and with a receiving-end synchronizing discriminator which, with the aid of the synchronizing bits, produces a synchronizing signal for the operation of the address generator, characterized by the following steps:

(a) in respect of each t.d.m. frame (R1, R2, R3) the synchronizing bit generator (SG) produces precisely one synchronizing bit (S) per t.d.m. frame and at least $p \geqq 6$ consecutive synchronizing bits (S) to form a synchronizing word (100010) over p t.d.m. frames;

(b) the synchronizing bits (S) of the synchronizing bit generator (SG) are fed at the transmitting-end via a data channel to the multiplexer (MUX);

(c) at the receiving-end the multiplex signal is input in serial fashion with the bit pulse train (TB) into a register (RG) which consists of at least 2pm-m cells;

(d) each m-th cell of the register (RG) is connected to a first decoder (DC1) and second decoder (DC2), which both respond to the synchronizing word (100010) and emit a first and second decoder signal respectively, and in the event of coincidence of the first and second decoder signals a synchronization recognition signal (SE) is emitted;

(e) when synchronization has not yet been attained, the synchronization recognition signal (SE) resets the count of a counter (Z1, Z2) which, from an initial count, counts a further number of counts equal to the product of m and p and which emits the synchronizing signal (Tp) to the address generator (AE);

(f) the synchronizing signal (Tp) is fed to a synchronizing word counter (Z3) which, in the event of coincidence of the synchronizing signal (Tp) with the first decoder signal, emits a resetting signal which resets the count of the synchronizing word counter (Z3), and emits a counting signal (Tq) when a given count has been reached;

(g) the counting signal (Tq) is fed to a trigger stage (K) which is controlled with the synchronizing word recognition signal (SE) and emits an alarm signal (KA) when the first decoder signal fails to appear.

4,132,868

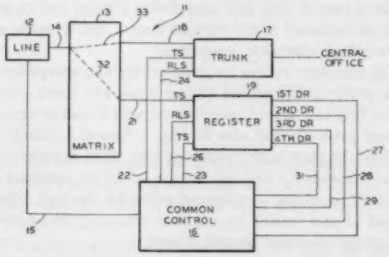
PABX SYSTEM PROVIDING MULTIPLE PATHS HELD BETWEEN CALLING LINE CIRCUITS AND A PLURALITY OF OUTPUT CIRCUITS

James P. Caputo, Elmwood Park, Ill., assignor to Entel Corporation, La Grage, Ill.

Filed Apr. 11, 1977, Ser. No. 786,205

Int. Cl.[2] H04Q 3/42

U.S. Cl. 179—18 E **15 Claims**



2. A telephone system used for connecting line circuits to other line circuits comprising:

a plurality of line circuits;

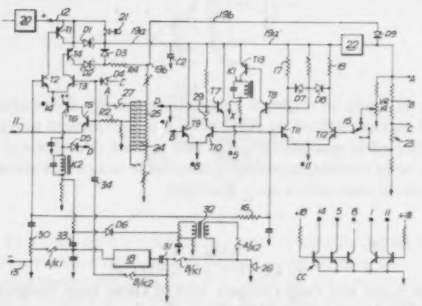
switching matrix means;
means for connecting said line circuits to said switching matrix means to provide one appearance for each of said line circuits at said switching matrix means;
function circuits at the output of said switching matrix means;
said function circuits used to complete calls from calling ones of said line circuits to called ones of said line circuits and to distant line circuits;
said function circuits comprising trunks, registers, and links;
means for coupling said function circuits to the output side of said switching matrix means;
means connecting a desired one of said line circuits through said switching matrix means to more than one of said function circuits; and
means for simultaneously holding the connections between the desired one of said line circuits and the more than one of said function circuits.

4,132,869

INTERCOMMUNICATION SYSTEM

James H. Knox, Velwell House, Velwell, Dartington, Devon, England

Filed Jun. 23, 1977, Ser. No. 809,416
Claims priority, application United Kingdom, Jun. 25, 1976, 26437/76
Int. Cl.[2] H04M 9/02
U.S. Cl. 179—38 **20 Claims**



1. In an intercommunication system of the type comprising:
a plurality of stations,
a single common signal line interconnecting said plurality of stations, on which line said stations impress, in use of the system, both information signals and biasing signals for determining the recipient station,
gating means in each station operating to pass signals accompanied by a biasing voltage to which said gating means of that station are preset,
the improvement wherein each station has a lockout circuit operating to disable that station from transmitting information signals onto said common line when said common line carries a voltage greater than a predetermined minimum voltage.

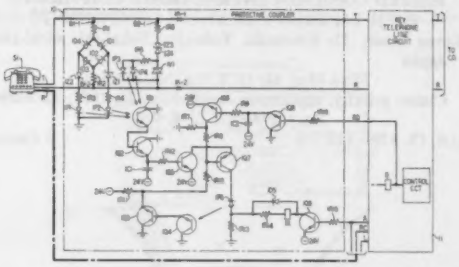
4,132,870

KEY TELEPHONE SYSTEM OPTICALLY COUPLED PROTECTIVE COUPLER

Chao Kai Liu, Matawan, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 3, 1977, Ser. No. 848,208
Int. Cl.[2] H04M 1/00
U.S. Cl. 179—81 R **9 Claims**

1. A protective coupler circuit for use in conjunction with a key telephone line circuit wherein the off-hook condition of a telephone station set is controlled by an A lead signal and where the ring-detection condition is controlled by a ring-detected signal, said coupler circuit comprising
a relay, having at least one contact for connection in the communication leads between the telephone station set and the central office, said relay operable under A-lead signal control for closing a communication path from said central office to said station set,



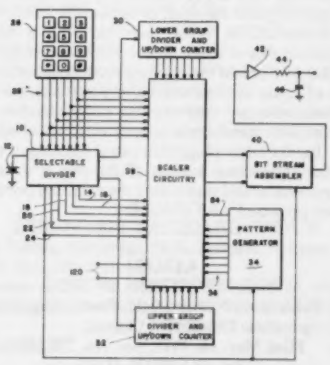
detection means operable for detecting voltages greater than a fixed threshold on said communication path,
means responsive to the enabling of said detection means for inhibiting the operation of said relay, and
overvoltage control means responsive to a ring-detected signal for rendering said inhibiting means inoperative so as to allow said relay to operate if only ringing voltage signals are present on said communication leads.

4,132,871

DIGITALLY SYNTHESIZED MULTI-FREQUENCY SIGNAL GENERATOR

Don W. Lake, Cupertino, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Jun. 22, 1977, Ser. No. 808,937
Int. Cl.[2] H04M 1/50
U.S. Cl. 179—84 VF **12 Claims**



1. A signal synthesizer for producing a sine wave signal from a binary signal source, said synthesizer including:
a controlled charge digital-to-analog converter;
slope pattern generating means coupled to the input of said converter for generating a plurality of binary pulse trains, each of said plurality comprising converter charging and discharging binary bits representing the slope at a predetermined one of a plurality of equally spaced points on a sine wave; and
clock responsive selection circuitry coupled to said generating means for selecting appropriate ones of said plurality of pulse trains in response to a frequency clock binary input signal, said clock responsive selection circuitry including scaler circuitry for synthesizing sine waves of

differing slopes and frequencies by attenuating the charge and discharge rates of said slope pattern charging and discharging binary bits through pulse-width-modulating each of said charging and discharging binary bits.

4,132,872

RIBBED CONICAL-CENTRAL DOME DIAPHRAGM WITH TAPERED THICKNESS COMPONENTS

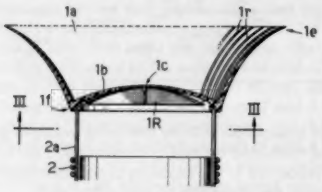
Kenzo Inoue, 22, Kitatanda, Yofu-cho, Tokai-shi, Aichi-ken, Japan

Filed Mar. 14, 1978, Ser. No. 886,464

Claims priority, application Japan, Mar. 26, 1977, 52/33894

Int. Cl.[2] H04R *7/14, 9/02*

U.S. Cl. 179—115.5 R **5 Claims**



1. A movable coil type electroacoustic vibrating plate having a voice coil and a bobbin therefor, being of rigid construction comprising:

an annular thin walled plate member, confined by an outer periphery and an inner periphery, the thickness thereof being largest at the inner periphery thereof and progressively diminished toward the outer periphery thereof, being of substantially a truncated conical configuration, and being provided with a number of integrally formed radial ribs extending from the inner periphery toward the outer periphery on the inner surface thereof with an equal circumferential angular distance with one another; and

a circular thin walled plate member of the same material as said annular plate member, of outwardly convexed dome-like configuration, being provided with a plurality of diametrical ribs in substantially half-moon shape in elevation thereof formed on the concaved inner surface thereof with an equal circumferential angular distance with one another, whereby said annular plate member and said circular plate member are concentrically bonded together, such that the latter plugs the central opening of the former and the connecting portion of the two is bonded at the foot portion of said dome onto the axial end portion of said bobbin provided with said coil.

4,132,873

MULTIPOSITION SWITCH

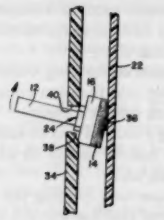
Cornelius Vanderpoel, New Fairfield, Conn., assignor to General Time Corporation, Thomaston, Conn.

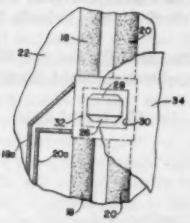
Filed Mar. 16, 1977, Ser. No. 778,158

Int. Cl.[2] H01H *23/30*

U.S. Cl. 200—6 R **7 Claims**

1. A switch comprising in combination a movable contact means including actuator means adapted to be gripped and moved selectively in toggle fashion from a switch open position in at least two opposite directions to respective switch closed positions, means for latching said actuating means in one of said switch closed positions, and said actuating means capable of returning to said switch open position following momentary location in said opposite switch closed position, and a bridging member supported by said actuating means, said bridging member including a body formed of a deformable, conductive material; stationary contact means, said stationary contact means comprising a printed circuit board having disposed thereon a printed circuit providing at least a pair of lands bridged by said bridging member when said actuator means is in any of said switch closed positions; and, means providing a surface interacting with said actuating means for restricting movement of said actuating means from said switch open position to one of said switch closed positions at which said body in a deformed state is located in juxtaposition with said





pair of lands to establish electrical continuity therebetween, said surface defined by sides of an aperture formed in a plate supported in spaced relation to said printed circuit board, and said body material imparting a bias first to return said actuating means to said switch open position.

4,132,874

ELECTRICAL SWITCH

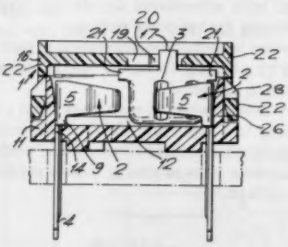
Aldo Bruni, and Luigi Campari, both of Turin, Italy, assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 10, 1977, Ser. No. 758,288

Claims priority, application United Kingdom, Jan. 8, 1976, 00580/76

Int. Cl.[2] H01H *15/02, 1/42*

U.S. Cl. 200—16 F **6 Claims**



1. An electrical switch comprising, two contacts each stamped and formed from a single piece of sheet metal stock and having a post and a receptacle portion comprising two opposed spring arms joined together at their root ends adjacent the post and extending in flag fashion therefrom with the free ends being bowed inwardly, one of said bowed ends being of smaller radius than the opposed bowed end, the two contacts being located in an insulating housing in spaced apart relation with mouths of their receptacle portions mutually opposed and

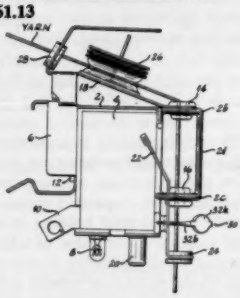
the posts depending from the housing, an elongated conductive slider contact located in the housing in alignment with the mouths and having complementary locating means for engaging the bowed ends of the arms, said slider contact slidable between first and second switching positions in which it is gripped by the arms of only one receptacle portion and of both receptacle portions respectively.

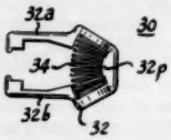
4,132,875

YARN DETECTOR SWITCH WITH SNAP-ON TRAPPER

Robert E. Shanebrook, Boothwyn, Pa., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Sep. 19, 1977, Ser. No. 834,818
Int. Cl.[2] B65H *25/14*
U.S. Cl. 200—61.13 8 Claims





1. In a yarn detector device having a housing including yarn guiding means, a detector mechanism in the housing including a spring-biased trip switch, a trip lever on the outside of the housing coupled to the trip switch and biased by the latter into one pivotal direction tending to operate the switch and having an eyelet through which the yarn passes and when taut holds the trip lever in its opposite pivotal direction maintaining the switch inoperative, the improvement comprising:

a yarn trapper mounted on the housing and comprising:

a multiple-turn helix;

a supporting bracket having a portion retaining said helix in bowed condition wherein the turns at one side are compressed more than at the other side where they are spaced apart to provide a plurality of V-grooves forming traps for the yarn;

said supporting bracket comprising a pair of spaced-apart arms extending from said helix-retaining portion thereof on opposite sides of the yarn to confine the yarn therebetween as the yarn approaches the eyelet of said trip lever;

snap-in means mounting the ends of said arms to the detector housing to confine the yarn between said housing, said arms and the corresponding spaced-apart turns of said helix that provide said traps to catch the yarn upon partial swinging of the trip lever due to slackness in the yarn thereby to prevent unwanted tripping;

said retaining portion comprising angularly-disposed means on said bracket retaining the opposite ends of said helix to hold it in its bowed condition;

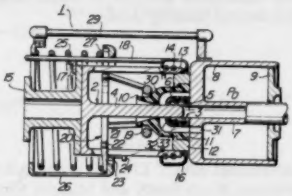
and converging inner sides on said arms for guiding the yarn toward the midportion of the helix where the separations between the turns are substantially uniform and most effective for trapping the yarn when it is drawn thereinto by partial swinging of the trip lever.

4,132,876

PUFFER TYPE GAS CIRCUIT BREAKER

Minoru Sato; Isao Takahashi; Takanao Kurasawa; Yoshio Yoshioka, and Yukio Nakagawa, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Sep. 8, 1976, Ser. No. 721,487
Claims priority, application Japan, Sep. 22, 1975, 50-[illegible]525
Int. Cl.[2] H01H *33/88*
U.S. Cl. 200—148 A 8 Claims



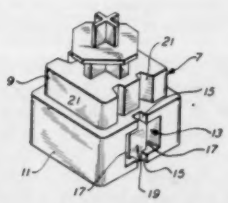
1. A puffer type gas circuit breaker comprising a first and a second arcing electrode movable relative to each other, an insulating nozzle surrounding said second arcing electrode, puffer means adapted to introduce an arc-suppressing gas into said insulating nozzle to extinguish the arc produced between said two arcing electrodes during the breaker motion for circuit breaking, movable shield means for relieving the concentration of an electric field at the front end of said first arcing electrode during the breaker motion for circuit breaking, said shield means being constructed so that, when the breaker is closed and the circuit made, said shield means surrounds said first arcing electrode and insulating nozzle and is located opposite to said insulating nozzle with a predetermined gap therebetween, said shield means being kept at the same potential as said first arcing electrode, and means for maintaining said predetermined gap and said same potential at least in the early stage of the breaker motion for circuit breaking, wherein said first arcing electrode is fixed and forms part of the stationary section of the circuit breaker while said second arcing electrode is movable and forms part of the movable section of the breaker, and said insulating nozzle is secured to the movable section so as to move integrally with said second arcing electrode, so that said means for maintaining said gap and potential causes said movable shield means to follow up the motion of said movable section, while maintaining said predetermined gap, at least in the early stage of the breaker motion for circuit breaking.

4,132,877

REMOVABLE KEYBOARD SWITCH

Phillip R. Daigle, Glenridge, N.J., assignor to Litton Business Systems, Inc., Morristown, N.J.

Continuation of Ser. No. 519,617, Oct. 31, 1974, abandoned.
This application Mar. 24, 1977, Ser. No. 780,723
Int. Cl.[2] H01H *13/16*
U.S. Cl. 200—296 10 Claims



1. A keyboard element capable of being readily inserted and removed from contact with a printed circuit board comprising:

a first housing portion of generally rectangular configuration having first and second pairs of opposed walls;

said first pair of walls being substantially planar and each wall of said second pair of walls having a relieved opening provided therein;

a second housing portion of generally rectangular configuration superposed over said first housing portion and being fixedly mounted thereto; and

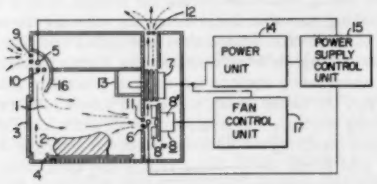
a manually engageable element in supporting relationship with said second housing portion.

4,132,878

HIGH-FREQUENCY ENERGY APPARATUS

Hajime Tachikawa; Kenji Satoh, and Mitsuru Watanabe, all of Yokohama, Japan, assignors to Hitachi Heating Appliances Co., Ltd., Japan

Filed Feb. 25, 1977, Ser. No. 771,917
Claims priority, application Japan, Feb. 26, 1976, 51-20286
Int. Cl.[2] H05B *9/06*
U.S. Cl. 219—10.55 B **14 Claims**



1. A high-frequency energy apparatus comprising:

a casing constituting a heating chamber for accommodating an object to be heated;

a high-frequency energy generator operative to generate high-frequency energy and feeding it to said heating chamber;

means for ventilating said heating chamber, said ventilating means including a ventilation path constituted in part by the space of said heating chamber;

first heating time control means for automatically controlling the heating time, said first heating time control means including temperature sensor means for sensing at least one of temperatures of the air within said haeting chamber and of the air drawn out of said heating chamber, and means for controlling said high-frequency energy generator to change the amount of supply of the high-frequency energy from said generator when the temperature sensed by said temperature sensor means reaches a predetermined value;

second heating time control means for manually controlling the heating time;

heat generating means disposed on a part of said ventilation path which is exterior of the heating chamber for generating heat;

means for selectively actuating said first and said second heating time control means to change heating time control mode between an automatic heating time control mode and a manual heating time control mode, respectively; and

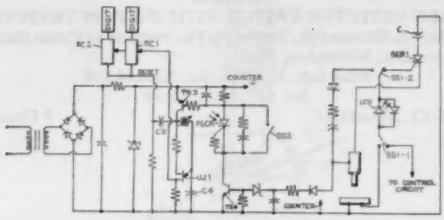
means responsive to said heating time control mode changing means, for changing the direction of ventilation established by said ventilating means in a manner so that the heat generated by said heat generating means is respectively exhausted from said apparatus and introduced into said heating chamber during said automatic and said manual heating time control modes.

4,132,879

ARC TIME INDICATING APPARATUS FOR STUD WELDING UTILIZING A CAPACITIVE POWER SOURCE

Paul A. Glorioso, Amherst, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed Sep. 27, 1976, Ser. No. 727,059
Int. Cl.[2] B23K *9/10, 9/20*
U.S. Cl. 219—98 **6 Claims**



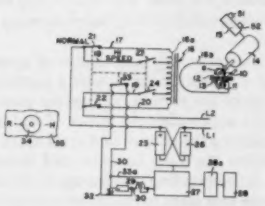
1. Apparatus for welding a stud to a workpiece by drawn-arc stud welding, contact stud welding, or gap stud welding utilizing capacitive power sources, said apparatus comprising means for holding the stud, capacitor means for supplying welding arc current to said stud holding means, means for producing a visual indication, the value of which is related to the length of time said visual indicating means operates, means for operating said visual indicating means, solid state switch means for initiating operation of said operating means, means for terminating operation of said operating means when a predetermined voltage still exists between the stud and the workpiece, selector switch means for bypassing said solid state switch means, means for causing said solid state switch means to conduct when the welding arc is initiated, second solid state switch means connected in series with said capacitor means and said stud holding means, and additional selector switch means having a first position for placing said causing means in series with the gate of said second solid state switch means, said additional selector switch means having a second position for placing said causing means in series with said stud holding means and said workpiece.

4,132,880

SEAM WELDING METHOD AND APPARATUS

Robert H. Blair, Bay City, Mich., assignor to Resistance Welder Corporation, Bay City, Mich.

Continuation of Ser. No. 477,784, Jun. 10, 1974, abandoned, which is a division of Ser. No. 313,773, Dec. 11, 1972, Pat. No. 3,823,300. This application Jul. 17, 1976, Ser. No. 697,040
Int. Cl.[2] B23K *11/06*
U.S. Cl. 219—114 **3 Claims**



1. In a seam welding system wherein the welding periods are synchronized with the frequency of the alternating current used to weld, which has a fictive current wave form; an electrode mechanism; motor means for continuously relatively moving the electrode mechanism and metallic material to be seam welded at a predetermined speed in terms of distance traveled per time interval while maintaining them in a state of welding engagement; a circuit including a transformer for applying single phase commercial frequency AC current, of

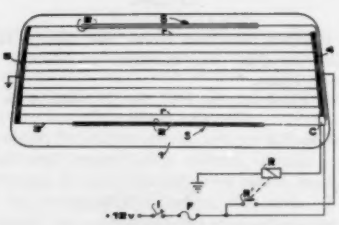
sufficient amperage to produce the energy to weld the material when transmitted during only the last 75°–40° of each successive current half cycle, electrically connected to the electrode mechanism to provide a succession of welding pulses; the circuit including a welding transformer providing a primary and a secondary winding for applying such sufficient amperage, and a single phase commercial frequency AC current power transmitting source electrically connected therewith, the circuit also including timing means interposed between the primary winding and source for timing the said current transmission such that it occurs synchronously with the frequency of the AC current in a portion of each successive half cycle which is at less than the maximum amplitude of the fictive current wave form, while substantially cutting off the current between current applications to permit cooling; said timing means sensing the zero current points and including ignitron devices which alternately transmit current only during positive and negative half cycles and terminate the welding pulses at the end of each half cycle, said timing means including an electrical resistance connected in the circuit to delay commencement of the current transmission to the welding transformer until the last 75°–40° of each half cycle.

4,132,881

ELECTRICALLY HEATED VEHICLE WINDOW HAVING PLURAL MOISTURE SENSING PROBES

Giorgio Ciarniello, Vasto, and Oscar De Lena, Termoli, both of Italy, assignors to Societa Italiana Vetro SIV S.p.A., Vasto (Chieti), Italy

Division of Ser. No. 531,098, Dec. 9, 1974, Pat. No. 4,048,469. This application Jun. 15, 1977, Ser. No. 806,937
Claims priority, application Italy, Dec. 12, 1973, 54277 A/73
Int. Cl.[2] H05B *3/06;* E06B *7/12*
U.S. Cl. 219—203 **5 Claims**



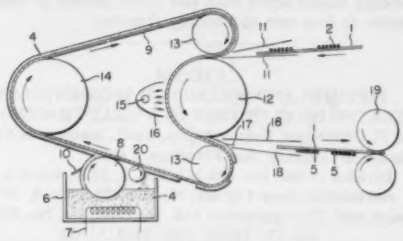
1. A defoggable window comprising:
a pane having a central viewing area;
a plurality of spaced generally parallel elongated heating resistors disposed on a surface of said central viewing area of said pane;
a first bus and a second bus disposed on said surface of said pane laterally of said central viewing area and connected to the respective ends of said resistors;
a plurality of electrically conductive, moisture-sensing probes spaced apart from each other and from said central viewing area at widely spaced zones on said pane, at least one of said probes including a conductive member disposed on a surface of said pane and having at least a portion thereof running substantially parallel to and closely spaced from one of said buses, each of said probes having at least a portion running substantially parallel to said heating resistors, said probes each having its repective latter said parallel running portion of a length approximately the length of said heating resistors and each of said probes being sensitive to fogging of said pane in its immediate vicinity.

4,132,882

PROCESS AND APPARATUS FOR FIXING TONER WITH HEAT AND A FIXING AGENT

Ichiro Endo, Yokohama; Toshiyuki Komatsu, Kawasaki, and Yoshio Takasu, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 28, 1976, Ser. No. 700,152
Claims priority, application Japan, Jul. 4, 1975, 50-82450; Jul. 8, 1975, 50-83859
Int. Cl.[2] H05B *1/00*
U.S. Cl. 219—216 **23 Claims**



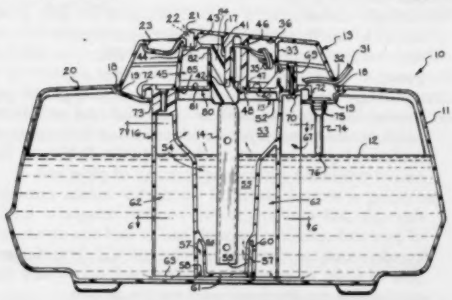
1. A process for fixing a toner image comprising the steps of: (a) providing a receiving surface having a toner image portion and a non-toner image portion; (b) contacting said toner image portion with a supported layer of fixing agent for said toner image; (c) providing sufficient heat to said toner image portion after step (a) to cause the fixing agent to selectively adhere to said toner image portion; and (b) separating said receiving surface from said supported layer of fixing agent after the fixing agent selectively adheres to the toner image portion.

4,132,883

ELECTRIC STEAM VAPORIZER

Thomas E. Grime, Toledo, Ohio, assignor to Champion Spark Plug Company, Toledo, Ohio

Filed Jun. 14, 1976, Ser. No. 695,541
Int. Cl.[2] H05B *3/60;* F22B *1/30;* A61L *9/02*
U.S. Cl. 219—284 **6 Claims**



1. An improved electric steam vaporizer comprising, in combination, a container for holding a body of liquid, a heating means including a pair of substantially parallel spaced elongated electrodes, means for mounting said heating means on said container with said electrodes extending downwardly into such body of liquid to adjacent a bottom of said container, means for applying an alternating current potential to said electrodes whereby liquid between said electrodes is heated to boiling by passage of current through the liquid, housing means surrounding said electrodes for defining a liquid boiling chamber, said heating means including means for discharging steam from said boiling chamber to the atmosphere, said housing means including a sidewall extending downwardly to substantially the bottom of said container and a closed bottom

connected to said sidewall, means defining a surge chamber surrounding a lower portion of said sidewall adjacent said housing bottom, said surge chamber having bottom opening means communicating with such body of liquid in said container and a closed upper end, and side openings means connecting at least an upper portion of said surge chamber adjacent said upper end with said boiling chamber for flowing heated liquid surging from said boiling chamber to primarily the upper portion of said surge chamber and downwardly towards said bottom opening means thereby forcing cooler liquid from said surge chamber into such body of liquid and for providing heated liquid from said upper portion of said surge chamber to flow into said boiling chamber.

4,132,884

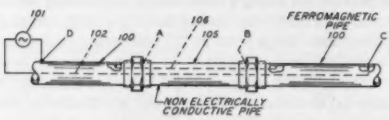
METHOD AND MEANS FOR SEGMENTALLY REDUCING HEAT OUTPUT IN A HEAT-TRACING PIPE

Paul F. Offermann, Redwood City, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 655,343, Feb. 5, 1976, which is a continuation-in-part of Ser. No. 520,815, Nov. 4, 1974, abandoned. This application Feb. 14, 1978, Ser. No. 877,642

Int. Cl.[2] H05B *3/00*; F16L *53/00*

U.S. Cl. 219—300 **2 Claims**



1. A method for reducing the heat output of a segment of heat generating pipe, comprising the steps of:

electrically connecting one end of a first electrical conductor means to a first terminal of an alternating current power source;

extending the opposite end of said first conductor means into a ferromagnetic pipe up to an extreme point of said ferromagnetic pipe where heat is desired and electrically connecting said opposite end to said ferromagnetic pipe at said extreme point;

electrically connecting a second terminal of said power source to said ferromagnetic pipe at a preselected point on said ferromagnetic pipe spaced apart from said extreme point;

connecting in place of a segment of ferromagnetic pipe located between said extreme point and said preselected point an electrically non-conductive non-ferromagnetic section of pipe to reduce the magnetic field and heat output produced within said segment of pipe; and

providing a second electrical conductor means extending through said non-conductive non-ferromagnetic section of pipe and connected at each end of said non-conductive non-ferromagnetic section of pipe to said ferromagnetic pipe in order to establish a current path across said non-conductive non-ferromagnetic section of pipe.

4,132,885

ELECTRIC SPACE HEATER

Dov Z. Glucksman, 43 Norwood Ave., Newton, Mass. 02159, and Karl H. Weidemann, 1580 Beacon St., Brookline, Mass. 02146

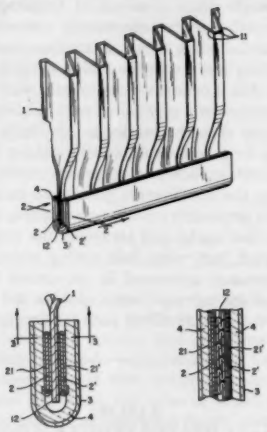
Filed Nov. 22, 1977, Ser. No. 854,045

Int. Cl.[2] F24H *9/02*

U.S. Cl. 219—345 **7 Claims**

1. An electric space heater comprising

a vertical heater plate consisting of a heat-conducting metal sheet of a horizontal dimension substantially greater than its vertical dimension, provided over its entire length with vertically extending, evenly spaced corrugations, the depth and shape of said corrugations being designed so that the unfolded length of the sheet is not more than three times the horizontal dimension of the corrugated heater plate, the corrugations in the bottom portion of the plate being compressed into a flat strip of a thickness not less than three times the thickness of the sheet metal forming the heater plate,



at least one heating element in the shape of a flat, electrically insulated resistor of a length substantially equal to the length of the heater plate, in intimate contact with the flat strip in the bottom portion of the said heater plate, force means for applying a steady pressure on the electric heating element to bias it against the flat portion of the heater plate.

4,132,886

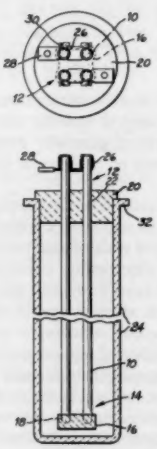
HEATING ELEMENT

Gary C. Blodgett, Boylston, Mass., and George H. Powers, Arlington Heights, Ill., assignors to Norton Company, Worcester, Mass.

Filed Oct. 14, 1977, Ser. No. 842,115

Int. Cl.[2] H05B *3/10*

U.S. Cl. 219—523 **3 Claims**



1. A heating element comprising a plurality of silicon carbide heating rods, each rod having a hot end and a cold end, an electrical input terminal and an electrical output terminal, at

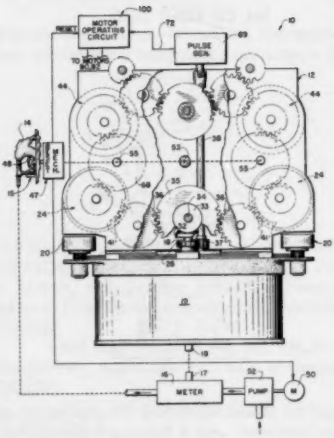
least two rods connected to each input terminal at their cold ends, at least two rods connected to each output terminal at their cold ends, the hot ends of all said rods being connected together by a silicon carbide bridge element whereby each heating circuit includes at least two input rods in parallel and two output rods in parallel with the input rods in series with the output rods.

4,132,887

COUNTING SYSTEM

Donald W. Fleischer, Wethersfield, Conn., assignor to Veeder Industries Inc., Hartford, Conn.

Filed Feb. 28, 1977, Ser. No. 772,943
Int. Cl.² G06M *1/10*
U.S. Cl. 235—92 FL **22 Claims**



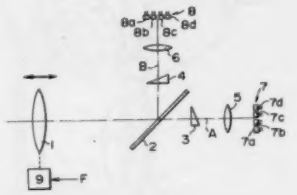
1. In a fuel pump delivery registration system for registering the volume and cost amounts of each fuel delivery and having resettable volume and cost counter sections with pairs of oppositely facing resettable volume and cost counters respectively, with respective banks of coaxial resettable counter wheels of increasing order, for registering the volume and cost amounts of fuel delivered respectively; volume counter operating means, including first mechanical drive means mechanically connected for mechanically indexing the banks of volume counter wheels for registering the volume amount of fuel delivered; cost counter operating means, including second mechanical drive means mechanically connected for mechanically indexing the banks of cost counter wheels for registering the cost amount of fuel delivered; and counter reset means mechanically connected to the banks of cost and volume counter wheels separately from the first and second mechanical drive means for separately mechanically resetting the cost and volume counter wheels and selectively operable for mechanically resetting the banks of cost and volume counter wheels between fuel deliveries; the improvement wherein the cost counter operating means comprises first and second electrical motors, wherein the second mechanical drive means comprises first and second wheel drive means mechanically connecting the first and second electrical motors respectively for indexing the lowest order and second lowest order cost counter wheels respectively for registering the corresponding order cost amounts of fuel delivered, and wherein the cost counter operating means comprises motor operating means for operating the first and second electrical motors for indexing the lowest order and second lowest order cost counter wheels for registering the corresponding order cost amounts of fuel delivered.

4,132,888

DEVICE FOR AUTOMATICALLY FOCUSING IMAGE

Toshihiro Kondo, 2-14-3, Kamiishihara, Chofu-shi, Tokyo, Japan, assignor to Toshihiro Kondo, Chofu and Fuji Photo Film Co., Ltd., Minami-ashigara, both of, Japan

Filed Mar. 17, 1977, Ser. No. 778,618
Claims priority, application Japan, Aug. 4, 1976, 51-92895; Mar. 17, 1976, 51-28835
Int. Cl.² G01J *1/36*
U.S. Cl. 250—204 **8 Claims**



1. A device for automatically focusing an image in an optical instrument including an objective comprising an axially movable objective, means for axially moving said objective in accordance with an electric focusing signal given thereto, means for dividing the optical path of the light passing through the objective into two optical paths located before the image plane of the objective, a refraction optical element located substantially on said image plane in one of said two optical paths, a first focusing means located behind said refraction optical element to form an image of the image focused on said image plane onto a second image plane on said optical path, a first photodetector means located on said second image plane on which said image is focused by said first focusing means, a second focusing means located behind the image plane in the other optical path to form an image of the image focused on said image plane onto a second image plane on said the other optical path, a second photodetector means located on said second image plane on which said image is focused by said second focusing means, means connected with said first and second photodetector means for comparing the output of said first photodetector means with that of said second photodetector means, and means connected with said comparing means for generating said electric focusing signal for driving said objective moving means to move the objective up to the position where the output of said first photodetector means becomes equal to that of said second photodetector means.

4,132,889

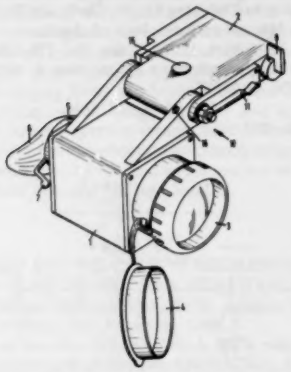
MONOCULAR NIGHT GLASS WITH PIVOTABLE POWER UNIT

Abraham Groeneweg, Ridderkerk, Netherlands, assignor to N.V. Optische Industrie "De Oude Delft", Netherlands

Filed Dec. 27, 1976, Ser. No. 754,364
Claims priority, application Netherlands, Jan. 7, 1976, 7600122; Jan. 30, 1976, 7600975
Int. Cl.² H01J *31/50*
U.S. Cl. 250—213 VT **4 Claims**

1. A monocular night glass comprising
an image intensifier unit;
a power unit having a shape contoured to fit against the body of the image intensifier unit; and
a hinge pivotally connecting the image intensifier unit to the power unit, the hinge allowing the power unit to fold against the image intensifier unit for compact storage in a first position and also allowing the power unit to serve as a counterweight for positioning of the image intensifier

unit by being pivoted through 90° relative to the image intensifier unit for viewing through one eye and being



pivoted through 180° relative to the image intensifier unit for viewing through the other eye.

4,132,890

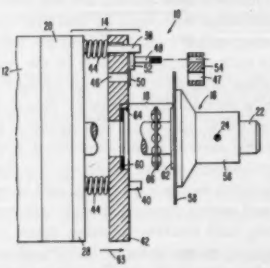
SELF ADJUSTING TACHOMETER

Joe L. Garcia, Arvada; Paul Y. Hu, Boulder, and Tracy N. Waller, Broomfield, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 22, 1977, Ser. No. 853,921

Int. Cl.[2] G01D *5/36*

U.S. Cl. 250—231 SE **15 Claims**



1. An electro-optical tachometer comprising in combination:
a movable assembly adaptable for mounting on the movable portion of a device;
said movable assembly comprising a hub portion,
a fastening means for attaching the hub portion to the movable portion of the device;
a transparent disk concentrically mounted on the hub having a plurality of light and dark lines defining an optical pattern;
a first spacer means connected to said hub;
a fixed assembly adaptable for mounting to the fixed portion of the device and positioned in spaced alignment with the movable assembly;
said fixed assembly having;
a support plate means;
an optical mask having an optical pattern thereon, said optical pattern being substantially identical to the pattern on the disk, and positioned in spaced alignment to the transparent disk;
a second spacer means connected to said support plate and in spaced alignment with the first spacer means;
a separator means positioned between the first spacer means and second spacer means; said spacer means being operable for defining a gap between the movable and fixed assembly;
mounting means operable for mounting the support plate to the device; and
resilient means operable for loading the fixed assembly against the first spacer means and thereby maintaining the gap constant.

4,132,891

EXPOSURE MEASURING SYSTEM FOR MICROSCOPE ATTACHED CAMERAS

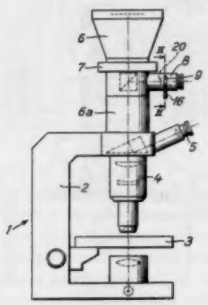
Herbert Leiter, Wetzlar, Fed. Rep. of Germany, assignor to Ernst Leitz Wetzlor GmbH, Marl, Fed. Rep. of Germany

Filed Aug. 15, 1977, Ser. No. 824,608

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1976, 2639020

Int. Cl.[2] G01D *5/34*

U.S. Cl. 250—239 **5 Claims**



1. In an exposure measuring system for attachment cameras to microscopes provided with a focusing telescope having a transverse slot for the selective insertion of two sliders, one of which is provided at the approximate slider center with a photodetector for the exposure-measuring system while the other consists of a transparent plate which bears a marking of circular shape or the like also approximately at the center of the slider and corresponding in size to that of the photodetector, the improvement comprising: said transverse slot having a guide path (**10**) of the sliders (**9**) displaceable in the plane of the slider and in that displacement means (**16**) actuated from outside the focusing telescope are provided to cause slider displacement.

4,132,892

RASTER SCANNING ION MICROSCOPE WITH QUADRUPOLE MASS FILTER

Klaus Wittmaack, Munich, Germany, assignor to Gesellschaft für Strahlen- und Umweltforschung mbH München, Nuremberg, Fed. Rep. of Germany

Filed Jul. 1, 1976, Ser. No. 701,683

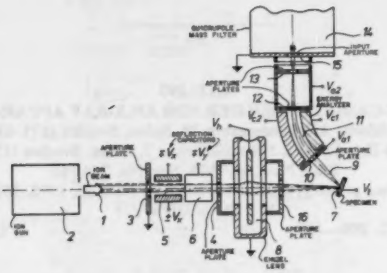
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1975, 2556291

Int. Cl.[2] G01N *23/00;* **H01J** *37/26*

U.S. Cl. 250—309 **5 Claims**

1. In a raster scanning microscope for determining the lateral distribution of elements, isotopes and compounds at the surface and in the body of a solid specimen and composed of means to produce a primary ion beam, means positioned in the path of the primary ion beam to focus and raster scan the primary ion beam over such a specimen for producing by emission therefrom a secondary ion beam, an energy analyzer positioned in

the path of the secondary ion beam, and a mass spectrometer disposed behind the energy analyzer in the path of the secondary ion beam for analysis thereof, the improvement wherein said mass spectrometer comprises a quadrupole filter.



4,132,893

METHOD AND APPARATUS FOR RECORDING AND OPTICALLY REPRODUCING X-RAY IMAGES

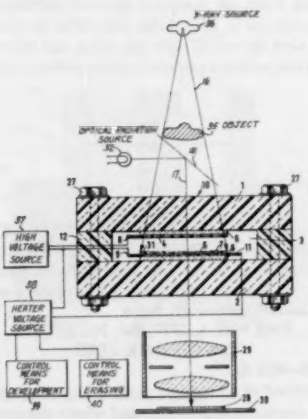
Roland Moraw, and Günther Schädlich, Naurod, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed May 13, 1977, Ser. No. 796,537

Claims priority, application Fed. Rep. of Germany, May 15, 1976, 2621715

Int. Cl.[2] G03B *41/16*

U.S. Cl. 250—315 A 18 Claims



1. A method for serially recording and optically reproducing X-ray images on a recording material, comprising the steps of disposing the recording material in an ionization chamber filled with a gas which is ionizable by X-rays; applying a high voltage across the ionization chamber; passing the X-rays to be recorded into the ionization chamber; heating the recording material until a deformation image is formed according to the charge distribution produced during irradiation due to the ionization of the gas; optically reproducing the deformation image; re-heating the recording material in the ionization chamber until the deformation image is erased by smoothing; and repeating the entire recording cycle.

4,132,894

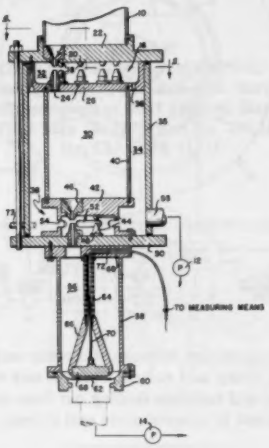
MONITOR OF THE CONCENTRATION OF PARTICLES OF DENSE RADIOACTIVE MATERIALS IN A STREAM OF AIR

Thomas J. Yule, West Chicago, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 4, 1978, Ser. No. 893,234

Int. Cl.[2] G01T *1/16;* G01N *15/06*

U.S. Cl. 250—435 4 Claims



1. An apparatus for monitoring the concentration of particles of dense radioactive material in air, the appartus comprising:

means for generating a stream of air containing particles of dense radioactive materials;

a first separating stage including a first plurality of virtual impactors receiving and separating the stream into a more concentrated stream of larger particles and a first stream of smaller particles;

means for exhausting the first stream of smaller particles;

a second separating stage including a second plurality of virtual impactors receiving and separating the more concentrated stream of larger particles into a twice concentrated stream of larger particles and a second stream of smaller particles;

means for exhausting the second stream of smaller particles;

filter means coupled to the twice concentrated stream of larger particles to trap particles from the twice concentrated stream of larger particles; and

means for measuring radioactivity of particles trapped by the filter means.

4,132,895

RADIOGRAPHY

Robert J. Froggatt, Southall, England, assignor to EMI Limited, Hayes, United Kingdom

Filed Jul. 27, 1977, Ser. No. 819,577

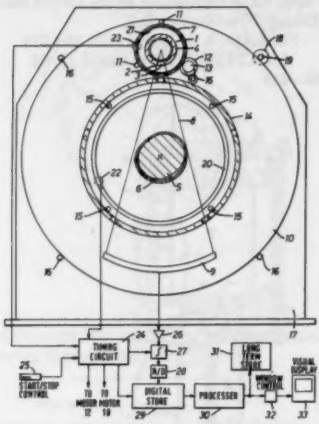
Claims priority, application United Kingdom, Aug. 28, 1976, 35912/76

Int. Cl.[2] A61B *6/02*

U.S. Cl. 250—445 T 7 Claims

1. Radiographic apparatus comprising means defining a patient position, a source of X-radiation arranged to project said radiation through a region of said patient position along at least one beam path, scanning means for moving said source angularly around said patient position to project said radiation through said region along further beam paths, sub-scanning means for sweeping said radiation laterally across said region to project said radiation through said region along more beam

paths, detector means being provided for detecting the radiation emergent from the region along each of said paths, and said sub-scanning means including an apertured collar which at least substantially encircles said source, and means for causing



relative rotational motion between said collar and said source to repetitively sweep said radiation across said region in the same direction; said radiation fanning out from said source to an extent sufficient to accommodate said sweeps.

4,132,896

METHOD OF FORMING LAYERED IMAGES OF OBJECTS FROM SUPERPOSITION IMAGES OF DIFFERENT IMAGE PLANES

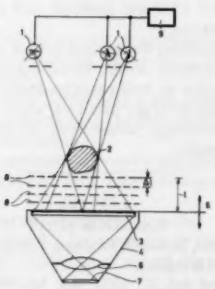
Erhard Klotz, Halstenbek, and Ulf Tiemens, Prisdorf, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 8, 1977, Ser. No. 785,969

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1976, 2616714

Int. Cl.[2] A61B *6/02*; G03B *41/16*

U.S. Cl. 250—445 T **7 Claims**



1. A method of forming a layered image of a three-dimensional object which is irradiated from different directions by a plurality of radiation sources, comprising the steps of sequentially recording n coded superposition images of a single movement phase on a mechanically moved detector face in different image planes and decoding the n superposition images by successive electronic superposition and summation by means of a coordinate matrix whose coordinates correspond to the geometry of the radiation source distribution, for a number of times which equals the number of radiation sources, whereby the same layer of the object is decoded n times and the n decoded layers are summed to form a layered image.

4,132,897

FILM-CASSETTE HOLDER FOR AN X-RAY APPARATUS

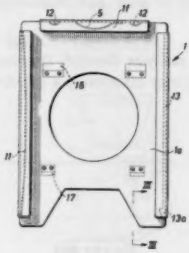
Eric Ohlson, Ankdammsgatan 29, Solna, Sweden (171 43), and Carl-Eric Ohlson, Framnäsbacken 7, Solna, Sweden (171 42)

Filed Nov. 24, 1976, Ser. No. 744,745

Claims priority, application Sweden, Nov. 26, 1975, 7513314

Int. Cl.[2] G03B *41/16*

U.S. Cl. 250—468 **4 Claims**



1. A film-cassette holder for an X-ray apparatus provided with means for removably mounting the film-cassette in the holder in the correct position therein, wherein the mounting means comprises a base, two side walls, each of which has a roof portion, and an end wall having a roof portion, wherein spring tongues are provided adjacent the base in the region of the side walls beneath respective roof portions, said tongues being arranged to urge the film-cassette upwardly against the roof portions, when the cassette is inserted into the holder, and which are arranged to permit the cassette to be removed from said holder with the use of only one hand, and wherein at least one of said roof portions exhibits a downwardly extending stop shoulder.

4,132,898

OVERLAPPING BOUNDARY ELECTRON EXPOSURE SYSTEM METHOD AND APPARATUS

Fred K. Buelow, Los Altos Hills; John J. Zasio, Sunnyvale, and Laurence H. Cooke, Cupertino, all of Calif., assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 1, 1977, Ser. No. 847,476

Int. Cl.[2] A61K *27/02*

U.S. Cl. 250—492 A **18 Claims**

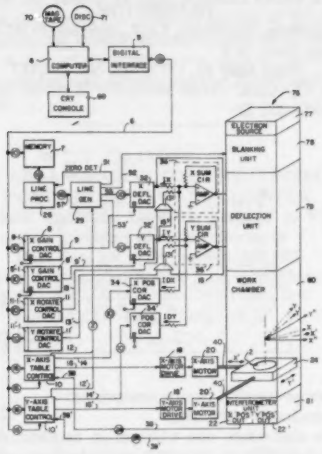
1. The method of scanning a pattern on a work piece where the pattern covers a pattern area and where the pattern area is divided into a plurality of contiguous partitions each having a partition area smaller than said pattern area, the steps comprising,

generating for an exposing beam a scan field having a scan area greater than said partition area,

relatively moving said scan field and said work piece to successively move said scan field to scan each of said partitions whereby an overlapping boundary region exists between the scan field relative to one of said partitions and the scan field relative to another one of said partitions contiguous to said one of said partitions,

selectively controlling the exposing beam in said overlapping boundary region to selectively expose portions of

said pattern in said boundary region either in connection with the scan field of said one of said partitions or in



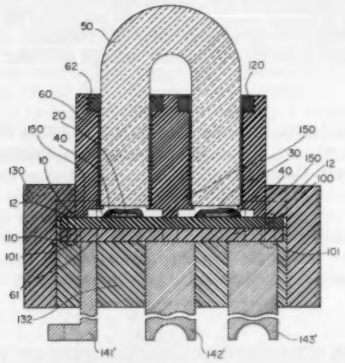
connection with the scan field of said another one of said partitions.

4,132,899

LIQUID-LEVEL DETECTOR

Junichiro Shigemasa, Yamatokoriyama; Takashi Ohno, and Sadao Tachikawa, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 22, 1976, Ser. No. 707,655
Claims priority, application Japan, Jul. 23, 1975, 50-90652
Int. Cl.[2] G01N *21/26*
U.S. Cl. 250—577 **1 Claim**



1. A liquid level meter comprising:

a light-emitting diode and a phototransistor pair connected in a Darlington configuration mounted on the same surface of a common substrate;

a U-shaped optical guide for conducting light emitted from said light-emitting diode to said phototransistor pair, the amount of light reaching the light-responsive element being proportional to the index of refraction of the material surrounding the optical guide, said optical guide being supported on said substrate so that the ends of said U-shaped optical guide face the light-emitting element and the light-responsive element, respectively, said U-shaped optical guide defining a plane disposed parallel to the plane of the top surface of the liquid, the level of which is being detected;

a ceramic cover extending from said substrate and surrounding a portion of said U-shaped optical guide, said cover optically shielding said light-emitting photodiode and phototransistor optical pair from each other across said substrate surface and from ambient light, said ceramic cover also shielding said photodiode and phototransistor Darlington pair from ambient heat;

a power source for supplying a constant current to said light-emitting photodiode; and

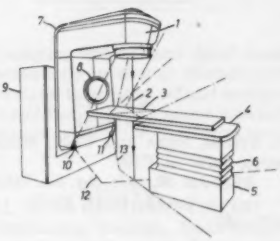
means for detecting a variation of an output signal of said phototransistor optical pair.

4,132,900

OPTICAL POINTER FOR RADIOGRAPHIC APPARATUS

William E. Smith, Fremont, and Robert J. Rorden, Los Altos, both of Calif., assignors to EMI Limited, Hayes, England

Filed May 12, 1977, Ser. No. 796,141
Int. Cl.[2] G03B *41/16*
U.S. Cl. 250—491 **6 Claims**



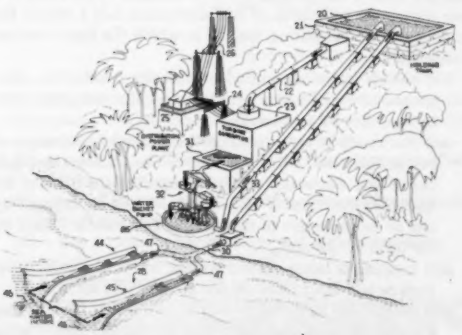
1. A therapeutic radiographic apparatus including a source arranged to provide a beam of penetrating radiation, at least two light sources each arranged to provide a planar divergent beam of light so that the at least two light beams intersect at a light substantially coincident with the central axis of the path of the radiation beam.

4,132,901

ELECTRIC POWER GENERATING SYSTEM

Don Crausbay, P.O. Box 1279, St. Thomas, V.I. 00801

Filed Aug. 7, 1975, Ser. No. 602,794
Int. Cl.[2] F03B *13/12*
U.S. Cl. 290—53 **10 Claims**



1. An electric power generating system for use in combination with a source of water power, said system comprising an elevated water storage means, water powered electric power generator means coupled to said storage means for receiving water under pressure therefrom, and water powered pump means adapted to be connected to the source of water power for pumping at least a portion of the requirements of said

generator to said water storage means; said water powered pump means being of the wave motor type and including a plurality of separate pumps, a plurality of beam type baffles disposed end to end adjacent one another in trough means for defining the path of movement of waves wherein a trailing end portion of one of said baffles overlaps the leading end portion of an adjacent one of said baffles, each of said plurality of baffles connected to one of said separate pumps and movable through a pumping stroke from an upright position to a generally horizontal position at least in part by the weight of water of a wave of water passing thereover, and means for interconnecting a trailing end portion of a first of two adjacent baffles to a leading end portion of a second of said two adjacent baffles for moving one another in opposite directions wherein adjacent baffles move each other through return pumping strokes.

4,132,902

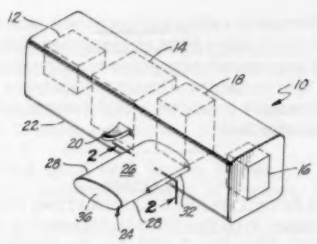
SWITCH

Charles E. Everest, Santa Ana, Calif., assignor to Telatemp Corporation, Fullerton, Calif.

Filed Jul. 30, 1976, Ser. No. 710,150

Int. Cl.[2] H01H *35/00*

U.S. Cl. 307—116 **5 Claims**



1. An electrically powered instrument having an electrically non-conductive handle adapted to be engaged by the hand of a user during the utilization of said instrument and a switch for turning said instrument on and off in which the improvement comprises:

said switch including spaced electrically conductive electrodes, said electrodes being electrically insulated from one another by said handle,

said electrodes being located on the front and rear edges of said handle remote from one another in positions in which one of said electrodes will be engaged by the palm of the hand and the other of said electrodes will be engaged by one or more fingers of the hand as said handle is held by the hand of the user,

said instrument being shaped so that when laid upon a flat surface said electrodes cannot contact said surface,

said switch also including power supply means for applying a voltge between said electrodes, said supply means being connected to said electrodes,

said switch further including discriminating means for detecting a change in the electrical resistance between said electrodes occurring either when said handle is engaged by the hand of the user or when said handle is released from the hand of the user and for releasing power to operate said instrument when said electrodes are connected to the hand of the user, said discriminating means being connected to at least one of said electrodes.

4,132,903

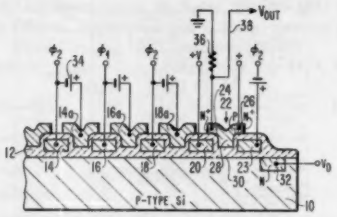
CCD OUTPUT CIRCUIT USING THIN FILM TRANSISTOR

Scott O. Graham, Sunnyvale, Calif., assignor to RCA Corporation, New York, N.Y.

Filed May 12, 1977, Ser. No. 796,417

Int. Cl.[2] G11C *19/28*; H01L *29/78, 49/02, 29/04*

U.S. Cl. 307—221 D **8 Claims**



1. A charge-coupled device comprising:

a semiconductor substrate;

multiple electrodes, one adjacent to another, all insulated from the substrate, to which multiple phase voltages may be applied for the storage and propagation of charge signals along the substrate;

one of said electrodes comprising spaced regions of one conductivity type serving as the source and drain regions of a transistor and a third region of different conductivity type between said spaced regions serving as a conduction channel, said third region being located adjacent to a portion of the substrate, said portion of the substrate serving as the gate electrode of said transistor;

a load; and

two terminals for an operating voltage source, one terminal coupled to one of said source and drain regions through said load and the other terminal coupled to said other of said source and drain regions, said transistor being responsive to charge propagated to said portion of the substrate serving as the gate electrode of said transistor, said charge affecting the flow of current through said load.

4,132,904

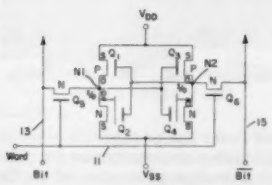
VOLATILE/NON-VOLATILE LOGIC LATCH CIRCUIT

Eliyahou Harari, Irvine, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Jul. 28, 1977, Ser. No. 819,794

Int. Cl.[2] G11C *11/40*

U.S. Cl. 307—238 **33 Claims**



1. A bistable latch circuit having a pair of branches connected across a common supply voltage, each branch including a load and a driver connected in series at a respective node, either the load or the driver, or both, in each said branch comprising an IGFET having its source-to-drain circuit connected in said branch and its control gate cross-connected to the node of the other branch so that, when a respective one of said IGFETs is turned on, the potential between said nodes rises toward said supply voltage, the relative potentials of said nodes reflecting the particular IFGET so turned on, thereby rendering said circuit bistable for volatile information storage,

characterized by at least one of said cross-connected IGFETs having a variable threshold voltage, said threshold voltage being varied by raising its gate potential above a predetermined level relative to the potential on one of its other electrodes, whereby the volatile information stored in said latch by placing it in one of its stable states may be rendered nonvolatile by raising said supply voltage above said predetermined level.

4,132,905
CIRCUIT ARRANGEMENT FOR THE CONTROL OF A FORWARD-REARWARD-COUNTER

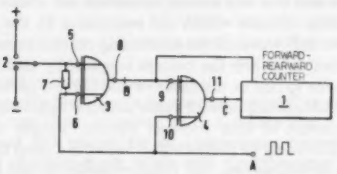
Manfred Stein, Eschborn, Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Germany

Filed Sep. 27, 1977, Ser. No. 836,992

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1976, 2645491

Int. Cl.[2] H03K *21/30, 19/32*

U.S. Cl. 307—247 A **5 Claims**



1. A circuit arrangement for control of a forward-rearward-counter with at least one manually actuatable switch over which the reversing input of the counter can be applied with different potential and the count input with count pulses, comprising

a first anticoincidence member having two first inputs and a first output,

a high-ohm resistor connected across said two first inputs,

a second anticoincidence member having two second inputs and a second output, one of said second inputs of said second anticoincidence member is connected to said first output of said first anticoincidence member,

a counter having a reversing input connected to said second output of said second anticoincidence member and having a count input connected to said one of said second inputs of said second anticoincidence member,

switch means for operatively triggering one of said first inputs of said first anticoincidence member, the other of said first inputs of said first anticoincidence member and the other of said second inputs of said second anticoincidence member being adapted to receive counting pulses.

4,132,906
CIRCUIT TO IMPROVE RISE TIME AND/OR REDUCE PARASITIC POWER SUPPLY SPIKE CURRENT IN BIPOLAR TRANSISTOR LOGIC CIRCUITS

Gordon H. Allen, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 28, 1977, Ser. No. 772,709

Int. Cl.[2] H03K *17/00*

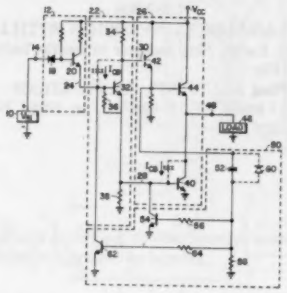
U.S. Cl. 307—254 **13 Claims**

1. A circuit having an improved switching speed responsive to at least one input logic signal and being coupled to an output terminal comprising:

(a) a first switching means responsive to the input logic signal for establishing a first logic level at the output terminal, said first switching means having at least an input electrode and an output electrode;

(b) a second switching means coupled to said first switching means and responsive to a drive signal derived from the input logic signal for establishing a second logic level at the output terminal;

(c) capacitive means connected to said input electrode for deriving a transient signal in response to a transition in the input logic signal;



(d) means for coupling said transient signal to said second switching means for providing an alternate current path for said drive signal to help turn off said second switching means when said first switching means is switching from the nonconducting state to the conducting state.

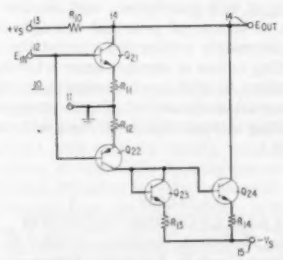
4,132,907
FULL WAVE RECTIFIER CIRCUIT

Paul C. Davis, Muhlenberg Township, Berks County, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 12, 1977, Ser. No. 824,085

Int. Cl.[2] H03K *5/00;* **H04B** *1/00*

U.S. Cl. 307—255 **6 Claims**



1. A single-ended input full wave rectifier circuit comprising

(a) a pair of complementary transistors having emitters connected to form a common emitter circuit,

(b) an input terminal connected to the base electrodes of said complementary transistors,

(c) a pair of emitter resistors serially connected in said common emitter circuit,

(d) a first terminal node between said emitter resistors,

(e) a first voltage supply terminal,

(f) a second voltage supply terminal,

(g) a load resistor connected between the collector electrode of one of said complementary transistors and said first voltage supply terminal,

(h) an output terminal node between said load resistor and the collector electrode of said one complementary transistor,

(i) a diode-connected transistor having its collector and base electrodes connected to the collector electrode of said other complementary transistor,

(j) an inverter transistor having its base electrode connected to the base electrode of said diode-connected transistor

and its collector electrode to said output terminal node, and

(k) said diode-connected and inverter transistors having their emitter electrodes coupled to said second voltage supply terminal.

4,132,908

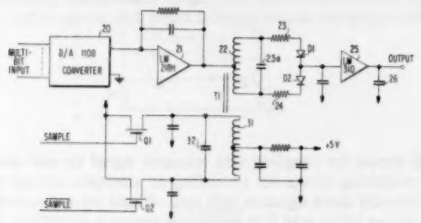
DIGITAL-TO-ANALOG CONVERSION WITH DEGLITCH

Bill B. Hughes, Largo, Fla., assignor to Smiths Industries, Inc., Clearwater, Fla.

Filed Aug. 4, 1977, Ser. No. 821,935

Int. Cl.² H03K *17/16*; G06F *3/14*; H01J *29/70*

U.S. Cl. 307—353 **6 Claims**



1. A deglitching circuit for connection between a utilization device and a source of voltage periodically changing in amplitude to eliminate unwanted voltage excursions generated when said source changes in amplitude, comprising timed switching means serially connected to said source and to a capacitor, wherein the improvement comprises an improved timed switching means including:

a transformer winding with a center tap connected to said source, a pair of serially connected diodes connected across said winding with said capacitor connected to a junction of said diodes,

another winding of said transformer, said another winding connected to a source of potential through switching devices for alternately conducting current through said another winding in one or another sense whereby

a current transition in said another winding in one sense induces a potential in said one winding to reverse bias said diodes providing an open switch between said source and said capacitor.

4,132,909

ZERO AXIS CROSSING DETECTOR

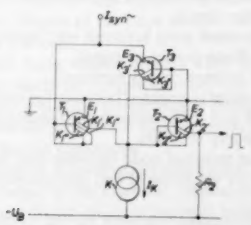
Karl-Diether Nutz, Heilbronn, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H, Frankfurt, Germany

Filed Nov. 18, 1976, Ser. No. 743,142

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1975, 2553764

Int. Cl.² H03K *5/153*

U.S. Cl. 307—354 **7 Claims**



1. In a zero axis cross detector for integrated bipolar circuits including an input terminal for an alternating current signal source, two current paths provided with a first and a second transistor respectively and connected in parallel, said two current paths being connected directly to said input terminal with said first transistor having its base connected to said input terminal so that the alternating current signal at said input terminal furnishes the turn on current for said first transistor and consequently for the associated one of said two current paths and with said second transistor having its emitter connected to said input terminal, circuit means interconnecting said transistors to cause a current to flow in one of said current paths during one half-wave of the alternating current signal, a current to flow in the other of said two current paths during the other half-wave of the alternating current signal, and both of said current paths to be blocked only during zero axis crossing of the alternating current signal, and means for providing an output signal during the zero axis crossing of the alternating current signal at said input terminal; the improvement wherein: said circuit means includes a constant current source connected to said first and second transistors so that its direct current output flows alternately via one of said two current paths during the two half-waves of the alternating current signal; both said first and second transistors are constructed as current mirror circuits which are responsive to the positive and negative half-waves of the alternating current signal at said input terminal to switch the current supplied by said constant current source to one or the other of said current paths always at the same alternating current value which is dependent on the constant current of said constant current source; and said means for providing an output signal includes a third transistor and means for connecting said third transistor to said constant current source to cause the current furnished by said constant current source to flow through said third transistor during the zero axis crossing of the alternating current signal to provide said output signal.

4,132,910

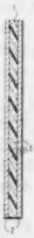
LINEARLY MOVING OR ROTATED FLAT ARMATURE FOR MOTOR AND PULLING MAGNETS

László Kiss; László Csillag; Károly Halmai, and László Miskolczi, all of Budapest, Hungary, assignors to Muanyagipari Kutato Intezet, Budapest, Hungary

Filed Nov. 11, 1976, Ser. No. 740,861

Int. Cl.² H02K *41/02, 1/22*

U.S. Cl. 310—12 **5 Claims**

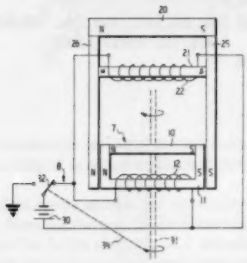


1. A linearly moving or rotated flat armature for motors or pulling magnets, comprising a carrier of plastics or of ceramics and a coil system placed on this carrier, characterized in that said carrier contains 2 to 50% by weight of a mild magnetic substance distributed therein homogeneously, said mild magnetic substance having a permeability of 10,000–100,000 μ and a coercive force of 0.015–1 Oe, said carrier being a flat sheet, and said coil system comprising at least one thin layer of conductive material on at least one side of said carrier.

4,132,911
ELECTRIC MOTOR WITH PERMANENT MAGNETS COMBINED WITH ELECTROMAGNETS

Carlos S. Garron, Kensington, Md., assignor to C. S. G. Enterprises, Inc., Rego Park, N.Y.

Continuation of Ser. No. 669,718, Mar. 24, 1976, abandoned, which is a continuation of Ser. No. 402,284, Oct. 1, 1973, abandoned. This application Jun. 16, 1977, Ser. No. 807,318
Int. Cl.[2] H02K *37/00*
U.S. Cl. 310—46 3 Claims



1. An electric motor comprising:

an assembly including a permanent magnet, an electromagnet, and first magnetic circuit means for providing a closed flux circuit for said permanent magnet, through said electromagnet, when said electromagnet is deenergized, and for providing an external flux path for the additive flux of both said permanent magnet and said electromagnet when said electromagnet is energized, wherein the magnetic density in said external path is substantially doubled as compared to the density which would result from a single one of said magnets;

means for energizing and deenergizing said electromagnet; and

second magnetic circuit means disposed in said external flux path for causing a magnetic reaction to provide relative movement between said assembly and said second magnetic circuit means when said electromagnet is energized, wherein said magnetic reaction is substantially eliminated when said electromagnet is deenergized, and wherein said force of magnetic reaction is more than doubled as compared to the reaction which would result from a single one of said magnets.

4,132,912
QUIET COOLING SYSTEM FOR DYNAMOELECTRIC MACHINES

Terry Wright, Lafayette, Ind., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 638,000, Dec. 5, 1975, abandoned. This application Jun. 2, 1977, Ser. No. 802,934
Int. Cl.[2] H02K *9/06*
U.S. Cl. 310—62 7 Claims

1. A dynamoelectric machine having a quiet cooling system comprising:

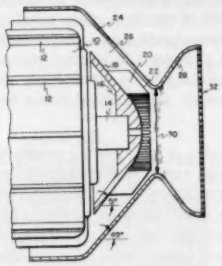
a rotor;

a conical hub disposed on said rotor;

a plurality of short chord axially disposed radial blades disposed on said conical hub for driving a coolant upon rotation of said rotor;

a truncated conical shroud enclosing said conical hub and defining a diverging conical annulus therebetween, the distance at the inlet between said truncated conical shroud and said conical hub being greater than at the outlet with the total annular cross-sectional area being greater at the outlet than at the inlet; and

said blades having blade tips substantially facing said inlet with said truncated conical shroud covering approximately one half of said blade tips while defining a substantially uniform clearance therebetween, said truncated conical shroud accepting said coolant for quietly diffusing

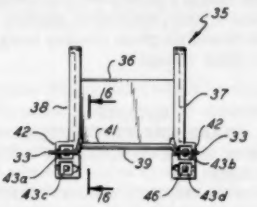


through said diverging conical annulus into the proximity of surfaces susceptible to heating.

4,132,913
FIELD-COIL BOBBIN WITH BUILT-IN-ONE-SHOT THERMAL PROTECTOR

Max E. Lautner, and Thomas J. Flint, both of Watertown, N.Y., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Nov. 22, 1976, Ser. No. 743,705
Int. Cl.[2] H02K *11/00*
U.S. Cl. 310—68 C 6 Claims



1. A bobbin for supporting an electric motor field coil comprising a spindle on which the coil wire is wound and integral flanges at each end of the spindle, the bobbin being molded from a plastic resin material having good electric insulating characteristics, an outwardly opening groove being formed in the spindle and extending lengthwise thereof, the groove being narrowly spaced from the outer surface of the spindle, a one-shot thermal protector having terminal wires lying in the groove, and connecting means associated with each flange for electrically connecting one end of the terminal wires to an insulated lead wire to the coil and securing it to the flange and for electrically connecting the other end of the terminal wires to a start wire of the coil when it is wound on the spindle.

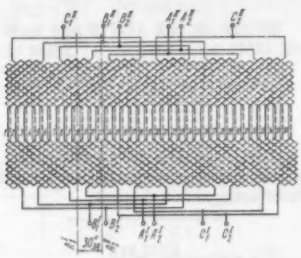
4,132,914
SIX-PHASE WINDING OF ELECTRIC MACHINE STATOR

Garri M. Khutoretsky, ulitsa Altaiskaya 20, kv. 5; Alexandr I. Vorontsov, Pushkin, ulitsa Khazova 43, kv. 94; Larisa A. Drozdova, prospekt Karla Marxa, 25, kv. 26, and Boris S. Yanik, Moskovsky prospekt 128, kv. 34, all of Leningrad, U.S.S.R.

Continuation of Ser. No. 570,495, Apr. 22, 1975, abandoned. This application Oct. 15, 1976, Ser. No. 732,641
Int. Cl.[2] H02K *3/00*
U.S. Cl. 310—184 1 Claim

1. A six-phase winding in an electric machine stator comprising: two three-phase windings electrically shifted relative to each other, through 30 electrical degrees, like phases of said three-phase windings being wound in opposite directions so that one three-phase winding is wound clockwise while the

other is wound counterclockwise, each phase winding being wound in one direction, a like phase being wound in another direction so that directions of separate phase windings alternate, leadouts of the three-phase windings being brought out at different sides of said stator, said windings being shifted both electrically and spatially relative to one another by 30°, said six-phase winding being a two-layer winding of a stator in a turbo generator, said leadout being brought out at opposite



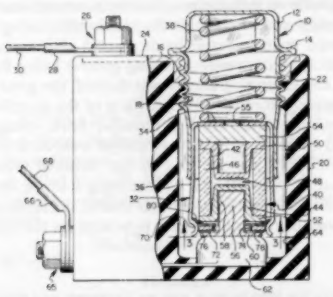
sides of said stator, each phase of the winding occupying circumferentially two-phase zone, the entire circumference being divided in two twelve phase zones, each phase zone having three slots, groups of coils of one-phase lodged in different phase zones being connected in parallel, voltage prevailing between the twin bars at a phase zone joint being substantially equal to the phase voltage, the highest possible voltage at a a phase long joint of said six-phase winding being reduced substantially to the phase voltage.

4,132,915

SPARK GAP PROTECTOR

Manfred W. Wilms, Goleta, Calif., assignor to Joslyn Mfg. and Supply Co., Chicago, Ill.

Filed Jan. 14, 1977, Ser. No. 759,532
Int. Cl.² H01J *17/00, 21/00*
U.S. Cl. 313—325 **16 Claims**



1. A spark gap protector comprising:

a gas tube spark gap device having at least a pair of conductive electrodes spaced apart by insulating means to provide a spark gap thereacross and having a hermatically sealed, predetermined gaseous environment in the region of said spark gap,

shorting means activated by heat for electrically shorting said conductive electrodes under predetermined discharge conditions,

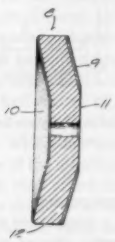
and a substantially flat insulating spacer interposed between a pair of metal members in intimate contact therewith and normally interrupting the electrical short circuit path of said shorting means, said insulating spacer providing thereacross an auxiliary gap between said metal members adapted to break down into an arc discharge at a voltage less than the breakdown voltage of said gas tube spark gap device absent its gaseous environment.

4,132,916

HIGH THERMAL EMITTANCE COATING FOR X-RAY TARGETS

Robert E. Hueschen, Hales Corners, and Richard A. Jens, Milwaukee, both of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 16, 1977, Ser. No. 769,067
Int. Cl.² H01J *35/08*
U.S. Cl. 313—330 **28 Claims**



1. An x-ray tube anode comprised of a body having a surface region for being impinged by electrons to produce x-radiation and a coating distinct from said region for enhancing the thermal emittance of said body, said coating comprising:

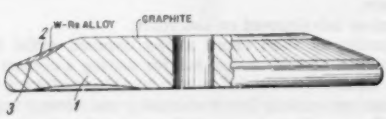
the product resulting from heating at a pressure of 10^{-5} Torr or lower and at a temperature in the range of 1650° C. to 1900° C. a mixture comprising about 2.5% up to about 20% by weight of TiO_2, at least one oxide, totalling in the range of 70% to 93.5% by weight, selected from a first group consisting of ZrO_2, HfO, MgO, CeO_2, La_2O_3 and SrO, and at least one oxide for stabilizing the oxide selected from first group and being selected from a second group consisting of CaO and Y_2O_3, the amount of oxide from said second group making up the difference between 100 weight percent and the sum of the percentages of TiO_2 and the oxide or oxides from said first group.

4,132,917

ROTATING X-RAY TARGET AND METHOD FOR PREPARING SAME

Hubert Bildstein; Hubert Petter, and Fritz Simader, all of Tyrol, Austria, assignors to Schwarzkopf Development Corporation, New York, N.Y.

Filed Mar. 16, 1977, Ser. No. 778,115
Claims priority, application Austria, Mar. 18, 1976, 2025/76
Int. Cl.² H01J *35/10*
U.S. Cl. 313—330 **10 Claims**



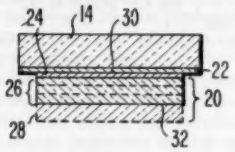
1. A rotating X-ray target comprised of a graphite body having brazed thereon a single- or multi-layer metal band focal track, the focal track surface representing the mantle surface of a flat frustrated cone, the improvement wherein the brazed surfaces of said graphite body and said metal band focal track have a configuration corresponding to an annular segment of a spherical surface.

4,132,918

POLYCRYSTALLINE SELENIUM IMAGING DEVICES

Charles J. Busanovich, Princeton, N.J., and Robert M. Moore, Carmel, Ind., assignors to RCA Corporation, New York, N.Y.

Filed Sep. 15, 1975, Ser. No. 613,059
Int. Cl.[2] H01J *29/45, 31/38*
U.S. Cl. 313—386 **8 Claims**



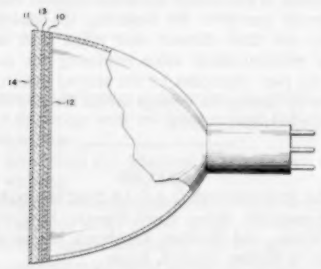
1. A photoconductive imaging device comprising:
(a) a thallium doped layer of hexagonal polycrystalline selenium;
(b) a layer of tin-oxide in intimate proximity to said selenium layer and forming therewith a mechanically stable blocking contact for holes abutting said selenium layer;
(c) a thin film of tellurium disposed between said tin-oxide layer and said selenium layer; and
(d) means whereby a charge pattern may be established along said selenium layer substantially as a charge replica of an image impinging upon said selenium layer.

4,132,919

ABSORBING INHOMOGENEOUS FILM FOR HIGH CONTRAST DISPLAY DEVICES

T. Grant Maple, Sunnyvale, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Dec. 12, 1977, Ser. No. 859,724
Int. Cl.[2] H01J *29/20, 1/62*
U.S. Cl. 313—466 **15 Claims**



1. A viewing screen for a luminescent display device comprising a transparent viewing portion, a luminescent phosphor layer on the interior surface of said viewing portion and a light absorbing inhomogeneous film covering and adherent to said phosphor layer, said film having a tapered composition varying continuously from a metal oxide at a point remote from said interface at the phosphor-film interface to the metal constituent of said oxide such that said film exhibits a continuous gradient of refractive index from an index approximating the index of said phosphor at the phosphor-film interface to an index approximating the index of said metal at said remote point, and said metal oxide being selected from the group of oxides consisting of tantalum oxide and vanadium oxide.

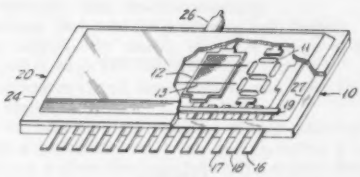
11. A method for making a viewing screen for luminescent display devices consisting essentially of the steps of:
forming a luminescent phosphor layer on a transparent substrate, and
forming a light absorbing inhomogeneous film on said phosphor substrate, said film having a tapered composition varying continuously from a metal oxide at the phosphor-film interface to the metal constituent of said oxide at a point remote from said interface such that said film exhibits a continuous gradient of refractive index from an index approximating the index of said phosphor at the phosphor-film interface to an index approximating the index of said metal at said remote point and said metal oxide being selected from the group of oxides consisting of tantalum oxide and vanadium oxide.

4,132,920

LUMINESCENT DISPLAY PANEL HAVING A TRANSPARENT AND CONDUCTIVE FILM MAINLY ON A WINDOW INSIDE SURFACE OF A GLASS COVER AND A METHOD OF MANUFACTURING THE SAME

Masaki Kobayakawa; Kazufumi Yawata; Kiyoshige Hirano, and Shigeru Yamashita, all of Izumi, Japan, assignors to Nippon Electric Kagoshima, Japan

Filed Dec. 21, 1976, Ser. No. 752,893
Claims priority, application Japan, Dec. 22, 1975, 50-153019
Int. Cl.[2] H01J *9/20, 63/02, 63/06*
U.S. Cl. 313—497 **10 Claims**



1. A luminescent display panel which comprises:
a substantially planar anode assembly comprising a plurality of luminescent anode segments;
a glass cover having integral peripheral flange portions and a window area surrounded by said flange portions;
a frit glass layer hermetically sealing said anode assembly and said flange portions together to enclose a vacuum space in cooperation with said anode assembly and said glass cover with said anode segments directed towards said vacuum space;
at least one hot cathode within said vacuum space and over said anode segments;
at least one grid also within said vacuum space between said cathode and said anode segments;
a plurality of lead-out conductors for said anode segments, said cathode, and said grid, said lead-out conductors being hermetically sealed in said frit glass layer along at least one of said flange portions; and
a transparent and electroconductive film on the surface of said window area which faces said anode assembly, said transparent and electroconductive film capable of serving as a means for preventing accumulation on said surface of electrons emitted by said cathode, said electroconductive film having a portion substantially more resistant on at least one of said flange portions to prevent electrical conduction between said lead-out conductors.

4,132,921

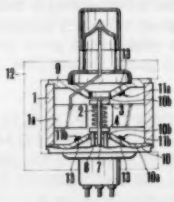
MEGNETRONS GETTER

Shunichi Hatayama, and Masao Sakai, both of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 11, 1977, Ser. No. 795,775
Claims priority, application Japan, May 14, 1976, 51-54392
Int. Cl.[2] H01J *25/50*
U.S. Cl. 315—39.51 **5 Claims**

1. In a magnetron of the type comprising a cathode electrode, a cylindrical anode electrode provided with a plurality of vanes arranged in the radial direction with respect to said cathode electrode to surround the same, said cathode electrode

and said vanes defining an interaction space therebetween, and a pair of magnetic pole pieces including frust-conical magnetic pole pieces disposed on the opposite ends of said anode electrode for guiding the magnetic flux from an external permanent



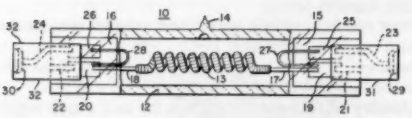
magnet to the interaction space, the improvement which comprises a non-evaporation type sintered metal powder getter secured to the surface of said magnetic pole piece facing the interior of said anode electrode except the tip of the frust-conical magnetic pole piece.

4,132,922

GAS-FILLED INCANDESCENT LAMP WITH INTEGRAL FUSE ASSEMBLY

Ralph E. Newton, Dover, and Henry M. Nixon, Westfield, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 13, 1977, Ser. No. 841,771
Int. Cl.[2] H01K *1/66*; H01J *7/44*
U.S. Cl. 315—73 **10 Claims**



1. An electric incandescent lamp comprising;

a vitreous envelope that contains an inert fill gas and is terminated at one end by an hermetic seal which has a pair of spaced foil conductors embedded therein,

a filament of refractory metal wire suspended within said envelope,

an inner lead-in conductor having one end disposed within the envelope and fastened to said filament and its other end embedded in said hermetic seal and connected to one of the foil conductors,

means for suppressing the formation of a destructive electric arc within the energized lamp when the filament fails comprising a non-coiled member of fusible metal that has each of its ends embedded in the hermetic seal and connected to the respective foil conductors with the medial portion of said member extending beyond said seal into the envelope and providing an electrical path between said foil conductors, and

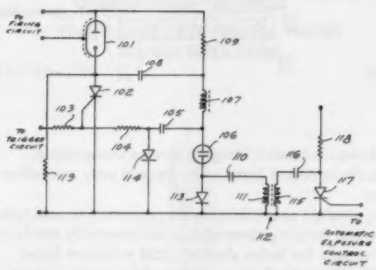
external connector means comprising an outer lead-in conductor that protrudes from said hermetic seal and has an end segment which is embedded in said hermetic seal and is electrically connected to the foil conductor which is not fastened to said inner lead-in conductor.

4,132,923

CIRCUIT FOR LIGHT-INTEGRATOR-CONTROLLED ELECTRONIC FLASH UNIT

Egon Gahler, Hattersheim, and Rolf Dietrich, Hofheim, both of Germany, assignors to Braun Aktiengesellschaft, Frankfurt am Main, Germany

Filed Jul. 1, 1976, Ser. No. 701,984
Int. Cl.[2] H05B *41/32*
U.S. Cl. 315—151 **25 Claims**



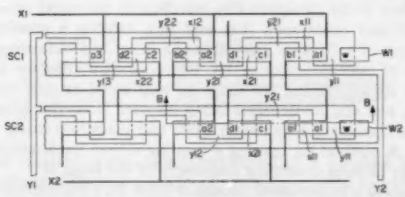
1. In an electronic flash unit, in combination, a flash element; a first electronic switch connected in the current path of the flash element; means for igniting the flash element by rendering the first electronic switch conductive; and means for terminating the flash by rendering the first electronic switch nonconductive, including a commutation capacitor and a second electronic switch interconnected with each other and with the first electronic switch for applying the commutation capacitor voltage to the first electronic switch as a reverse-bias voltage when the second electronic switch is rendered conductive, the second electronic switch having two electrodes defining therebetween the current path of the second electronic switch, the conductivity of the current path of the second electronic switch being controlled by controlling the voltage across the two electrodes of the second electronic switch, and light-integrating means operative for detecting the amount of light emitted by the flash element and when such amount has reached a predetermined value rendering the current path between the two electrodes of the second electronic switch conductive by raising the voltage across the two electrodes of the second electronic switch.

4,132,924

SYSTEM FOR DRIVING A GAS DISCHARGE PANEL

Hisashi Yamaguchi, Kobe; Kenji Murase; Hiroyuki Ishizaki, both of Kyogo, and Hirofumi Kashiwara, Kyogo, all of Japan, assignors to Fujitsu Limited, Japan

Filed Nov. 30, 1977, Ser. No. 856,035
Claims priority, application Japan, Nov. 30, 1976, 51/144142; Dec. 3, 1976, 51/145944; Mar. 3, 1977, 52/23423; Apr. 30, 1977, 52/50521
Int. Cl.[2] H05B *37/00, 39/00, 41/00*
U.S. Cl. 340—779 **19 Claims**



1. A driving system for shifting discharge spots along adjacent discharge cells in a gas discharge panel, said driving system shifting said discharge spots in said panel by repeating

a cycle of panel shift operation, each said cycle comprising a plurality of unit periods, said discharge cells being regularly arranged in said discharge panel, each of said cells being defined by a corresponding pair of electrodes, said electrodes being connected to a plurality of bus conductors, said driving system comprising:

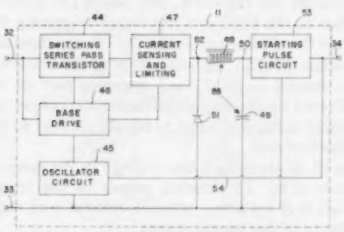
first circuit means for generating a plurality of basic pulse trains in each unit period, selected predetermined sequences of said basic pulse trains defining corresponding selected driving waveforms, and

second circuit means for cyclically distributing said basic pulse trains to each respective one of said bus conductors in corresponding ones of said predetermined sequences, whereby to provide respective driving waveforms to corresponding said bus conductors for each cycle of panel shift operation for shifting said discharge spots.

4,132,925
DIRECT CURRENT BALLASTING AND STARTING CIRCUITRY FOR GASEOUS DISCHARGE LAMPS

Joel J. Schmutzer, Oak Park, Ill., and George D. Elkerton, Edmonds, Wash., assignors to Forest Electric Company, Melrose Park, Ill.

Filed Jun. 15, 1976, Ser. No. 696,400
Int. Cl.² H05B *41/36, 41/16*
U.S. Cl. 315—208 **18 Claims**



1. Direct current ballasting and starting circuitry for operating a gaseous discharge lamp on direct current therefrom; said circuitry comprising:

a pair of input lines for attachment to a source of direct current voltage;

a pair of output terminals connectable to said lamp;

switching means in series in one of said pair of input lines, said switching means alternatively switchable between on and off conductive states for periodically supplying pulses of energy from said source of direct current voltage;

current sensing means for limiting the maximum current conducted by said switching means during the conductive state thereof;

filter means in series with said switching means for smoothing the pulses of energy delivered by said switching means into direct current with a comparatively small alternating current component;

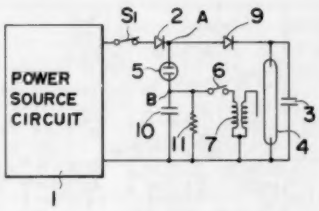
starting means in series in connection between said filter means and one of said pair of output terminals, said starting means responsive to a non-energized state of said lamp to provide a starting voltage pulse at an output terminal of a said circuitry of sufficient magnitude and duration to initiate ionization in said lamp, said starting means permitting uninterferred passage of current from said filter means to said output terminal after initiation of ionization in said lamp; and

control means momentarily excited by said starting voltage pulse and thereafter interacting with said switching means to control the conductive states of said switching means.

4,132,926
ELECTRONIC FLASH DEVICES

Yoshiharu Ohta, Izumi, and Hiroshi Hosomizu, Osaka, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 22, 1977, Ser. No. 780,176
Claims priority, application Japan, Mar. 26, 1976, 51-37457[U]
Int. Cl.² H05B *41/32*
U.S. Cl. 315—241 P **7 Claims**



1. An electronic flash device comprising:

an electronic flash tube for producing light flashes;

a main capacitor for storing electrical energy to be discharged through said electronic flash tube;

a power source circuit for supplying said main capacitor with electrical energy;

means for indicating the charging of said main capacitor above a predetermined level, and including a second capacitor, a glow discharge tube and a resistor forming a relaxation oscillator adapted to oscillate with said main capacitor charged above said predetermined level, said second capacitor and said resistor forming a parallelly connected circuit, said glow discharge tube and said parallelly connected circuit being connected in series with one another and in parallel with said main capacitor and said oscillation being observable from the intermittent glow discharge through said glow discharge tube;

means for triggering the flashing of said electronic flash tube with discharge current from said second capacitor;

a main switch means for switching said power source circuit between a first condition for supplying said main capacitor with electrical energy and a second condition for not supplying said main capacitor with electrical energy; and

means for preventing said indicating means from indicating and also for preventing said triggering means from triggering said flash device with said main switch means in said second condition, said preventing means including a diode connected between said main capacitor and said relaxation oscillator for preventing said main capacitor from supplying said relaxation oscillator with electrical energy with said main switch means in said second condition.

4,132,927
GATING SIGNAL GENERATOR FOR SWITCHED PINCUSHION CORRECTION CIRCUIT

Alvin R. Balaban, Lebanon, and Steven A. Steckler, Clark, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 11, 1977, Ser. No. 841,033
Int. Cl.² H01J *29/70*
U.S. Cl. 315—371 **13 Claims**

1. A pulse-duration modulated gating signal generator for use in conjunction with a television device including vertical and horizontal deflection rates, comprising:

a ramp signal source of vertical rate ramp signal;

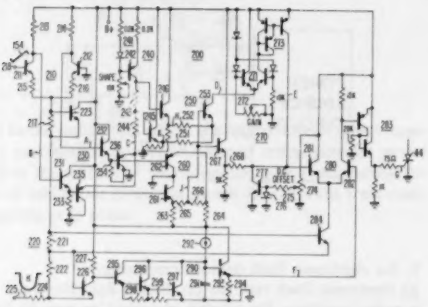
inverting means coupled to said source of vertical rate ramp signal for generating an inverted vertical rate ramp signal;

comparison means coupled to said ramp signal source and to said inverting means for passing the instantaneously larger of said ramp and inverted ramp signals;

offset signal generating means coupled to an output of said comparison means for generating at a first plurality of outputs a like plurality of signals each offset from the other by a fixed amount;

signal summing means coupled to said plurality of outputs of said offset signal generating means for forming a modified vertical rate ramp signal;

comparator means including a first input coupled to said signal summing means;



a source of horizontal rate signals;

ramp-generating means responsive to said source of horizontal rate signals for generating ramp-shaped horizontal rate signals; and

means coupling said ramp-shaped horizontal rate signals to a second input of said comparator means for forming at an output thereof a horizontal rate pulse which is duration-modulated by said modified vertical rate ramp signal.

4,132,928

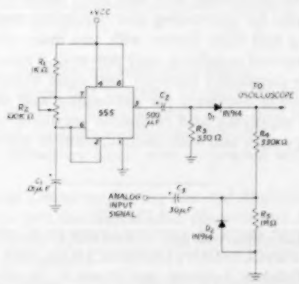
DEVICE FOR IDENTIFYING WAVEFORMS IN A MULTIPLE OSCILLOSCOPE DISPLAY

Howard M. Berlin, Wilmington, Del., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 28, 1977, Ser. No. 791,754

Int. Cl.[2] G01R *13/30*

U.S. Cl. 315—377 **1 Claim**



1. An electronic device for visually distinguishing differences between plural traces representing plural input signals on a multichannel oscilloscope comprising:

at least one **555** integrated circuit used as a square wave generator adapted to be coupled with said multichannel oscilloscope and have an additive signal effect on at least one of said plural input signals and cause it to appear on said oscilloscope as a signal trace with dots or dashes and be distinguishable from the other of said plural traces,

wherein the frequency of said generator is greater than said input signal to create said dots or dashes, and wherein diodes are used to isolate a portion of the input signal from said generator.

4,132,929

TELEVISION VERTICAL DEFLECTION CIRCUIT

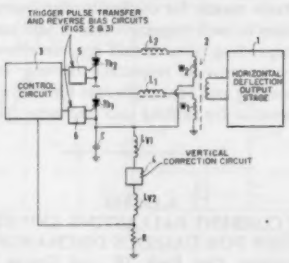
Werner Riechmann, Sibbesse, Germany, assignor to Blaupunkt-Werke GmbH, Hildesheim, Germany

Filed Aug. 8, 1977, Ser. No. 822,514

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1976, 2638872

Int. Cl.[2] H01J *29/70, 29/72*

U.S. Cl. 315—408 **11 Claims**


TRIGGER PULSE TRANSFER AND REVERSE BIAS CIRCUITS (FIGS. 2 & 3)
CONTROL CIRCUIT
HORIZONTAL DEFLECTION OUTPUT STAGE
VERTICAL CORRECTION CIRCUIT

1. In a deflection circuit for television receivers having vertical deflection coils (L_{V1}, L_{V2}):

a vertical deflection stage having a saw-tooth wave generator including a charge capacitor (C), two thyristors (Th_1, Th_2) connected to the charge capacitor to charge, and re-charge the capacitor, and means (3) applying trigger pulses to the thyristors to control triggering thereof and hence the charge applied to the charge capacitor (C);

and means (1, 2, L_1, L_2) connected to the horizontal deflection output stage (1) and applying part of the energy delivered by the horizontal deflection output stage to the vertical deflection stage to supply current to the vertical deflection coil

means (5, 6) applying a bias voltage to the gates of the thyristors (Th_1, Th_2) during pauses of the trigger pulses, which is of a polarity which is reverse with respect to the polarity of the trigger pulses.

4,132,930

BRUSHLESS D-C MOTOR WITH SEVERAL Y CONNECTED PHASE WINDINGS

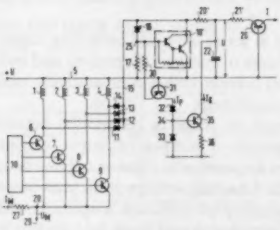
Karl Schalk, Nuremberg, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Sep. 14, 1977, Ser. No. 833,354

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1976, 2642472

Int. Cl.[2] H02K *29/00*

U.S. Cl. 318—138 **7 Claims**



1. In a brushless d-c motor with several Y connected phase windings which are coupled to a d-c source through a commutating arrangement including controlled semiconductor elements, each phase having one end coupled to a controlled semiconductor element and to one terminal of a pickup diode, the pickup diodes having their other terminals coupled to a

common tie point, a voltage dependent element having one terminal coupled to the common tie point and another terminal coupled through a series resistor to a neutral point, the load circuit of a controlled semiconductor switching element being shunted across the voltage dependent element and the series resistance with the actual speed value taken off through a smoothing member including at least a resistor and a capacitor, the improvement comprising:

(a) a first additional transistor having its base coupled to the neutral point;

(b) a first resistor coupling the junction point between the voltage dependent element and series resistor to the emitter of said first additional transistor; and

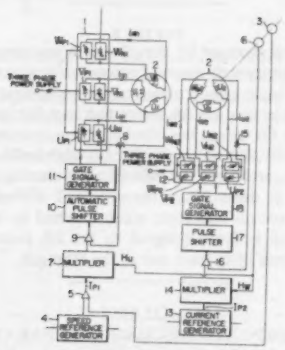
(c) a forward biased diode and series resistance coupling the collector of said first additional transistor to ground whereby a speed proportional current pulse can be picked up at the junction point between said diode and said series resistance.

4,132,931

CONTROL SYSTEM FOR A.C. MOTORS

Toshiaki Okuyama; Yuzuru Kubota, and Hiroshi Nagase, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 30, 1977, Ser. No. 829,000
Claims priority, application Japan, Sep. 3, 1976, 51-104867
Int. Cl.[2] H02P *7/46*
U.S. Cl. 318—732 **6 Claims**



1. A control system for an a.c. motor comprising:

(a) an a.c. motor having a polyphase primary winding and a polyphase secondary winding,

(b) position detector means for producing a position signal in dependence on rotor position of said a.c. motor,

(c) a first frequency converter for supplying an alternating current having a variable frequency to said primary winding,

(d) a speed control circuit for producing a current reference signal is dependence on deviation of a speed feedback signal from a speed reference signal,

(e) a current control circuit for controlling the alternating current fed to said primary winding so that said alternating current is in phase with said position signal and has a magnitude proportional to said current reference signal;

(f) a second frequency converter for supplying an alternating current having a variable frequency to said secondary winding,

(g) a second current control circuit for controlling said alternating current fed to said secondary winding so that said current is in phase with said position signal and has a magnitude of a constant value,

(h) phase sequence determining means for setting phase sequences for said primary and secondary windings in opposite phase relative to each other, and

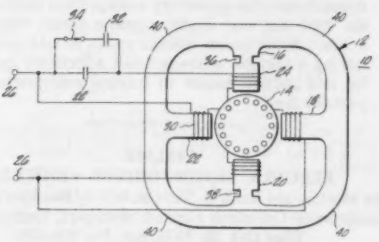
(i) frequency control means for controlling primary and secondary excitation frequencies so that ratio between said frequencies is at a predetermined value and sum of said frequency is equal to angular frequency of rotating electrical angle of said motor.

4,132,932

BALANCED SPLIT-PHASE ELECTRIC MOTOR

Cravens L. Wanlass, 9871 Overhill Dr., Santa Ana, Calif. 92705

Continuation-in-part of Ser. No. 597,529, Jul. 21, 1975, Pat. No. 4,063,135. This application Dec. 12, 1977, Ser. No. 859,282
Int. Cl.[2] H02P *1/44*
U.S. Cl. 318—795 **10 Claims**



1. An electric motor comprising:

a stator core having magnetic material comprising teeth and return material joining said teeth;

a first stator winding wound on said core and adapted to generate magnetic flux in some of said teeth and said return material;

a second stator winding wound on said core and adapted to generate magnetic flux in others of said teeth and said return material;

a rotor, an air gap between the stator and rotor;

a capacitor;

means connecting said capacitor and said first stator winding in series across said input and said second stator winding in parallel with the series connected first stator winding and capacitor; and

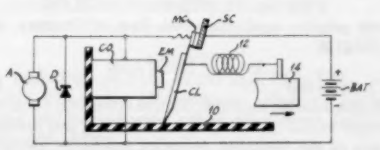
the structural configuration of the teeth associated with said first stator winding being different from the structural configuration of the teeth associated with the second stator winding to cause the density of the magnetic flux generated in the air gap by said first stator winding to be more limited than the density of the magnetic flux generated in the air gap by said second stator winding.

4,132,933

ELECTROMECHANICAL CHOPPER FOR SPEED CONTROL OF BATTERY POWERED DEVICES

James P. Barcz; James H. Bigelow, both of Milwaukee; James R. Jaeschke, Greendale; Earl T. Piber, Oconomowoc, and Gordon B. Spellman, Mequon, all of Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Dec. 23, 1976, Ser. No. 754,072
Int. Cl.[2] H02P *5/10*
U.S. Cl. 318—346 **22 Claims**



1. A D.C. electrical control system for controlling energization of a portable load from a storage battery comprising:

an electro-responsive chopper device comprising contact means connected in circuit with said portable load and

said storage battery for controlling the average voltage applied to said portable load during use;

manual means for applying resilient closing force to said contact means and for selectively varying the magnitude of said closing force thereby to correspondingly vary the closed-to-open ratio of said contact means and the average voltage applied to said portable load;

said chopper device also comprising electromagnetic means in circuit with said contact means and said storage battery, said electromagnetic means energizing when each closure of said contact means applies storage battery voltage thereto to cause reopening of said contact means to disconnect said storage battery voltage from both said portable load and said electromagnetic means whereby said contact means passes voltage pulses to said portable load having a variable average value selectively controllable by said manual means to control energization of said portable load.

4,132,934

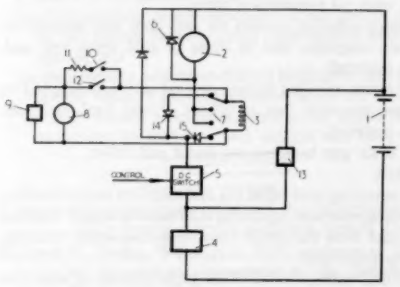
ELECTRIC MOTOR DRIVEN VEHICLES

John Morton, and Keith D. Stevens, both of Stockport, England, assignors to Cableform Limited, Stockport, England

Filed Oct. 28, 1976, Ser. No. 736,605

Int. Cl.[2] H02P *3/04*

U.S. Cl. 318—382 **5 Claims**



1. A dynamic braking control arrangement for a vehicle driven by an electric motor having a single field winding, comprising: means for controlling the supply of power to the motor, a permanent magnet generator mechanically coupled to the motor, and continuously operable circuit closure means for automatically connecting the output of the generator to said single field winding to dynamically brake the motor when the motor is de-energised by the controlling means, said generator output constituting the sole and entire source of electrical energy supplied to said single field winding during dynamic braking.

4,132,935

PHONOGRAPH TURNTABLE CONTROL SYSTEM

Harry Gaus, Kronberg; Jeffrey Johnson, Wiesbaden-Hessloch; Udo Milutziki, Walldorf, and Dietwald Schotte, Eschborn, all of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

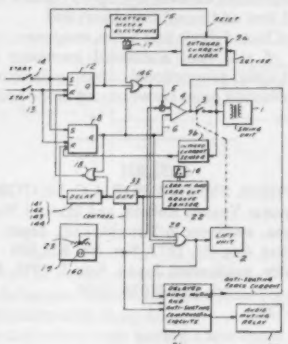
Filed Sep. 22, 1977, Ser. No. 835,535

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1976, 2642726

Int. Cl.[2] H02P *5/06*

U.S. Cl. 318—480 **1 Claim**

1. In an automatic turntable control system for phonographs, of the type including lifting means for lifting and lowering the tone arm of the turntable, swinging means for swinging the tone arm of the turntable inward and outward, and a platter motor for rotating the platter of the turntable, in combination therewith, a platter-motor storage having a motor-operate set state and a motor-not-operate reset state; means connected to the platter motor and to the platter-motor storage and operative for causing the platter motor to operate or not operate in dependence upon the state of the platter-motor storage; a second storage having set and reset states; touch-activated start-stop switch means operative when touched by the user to start the turntable for setting the platter-motor storage and the second storage and operative when touched by the user to stop the turntable for resetting the platter-motor storage and the second storage; logic-circuit means connecting the outputs of the storages to the swing unit and to the lift unit for applying activating signals to those units in dependence upon the combi-



nation of states assumed by the platter-motor storage and the second storage; switch means for transmitting activating signals from the logic-circuit means to the swing unit; switch-circuit means operative for rendering the switch means conductive when the lift means has lifted the tone arm; sensor means operative for sensing the reaching of predetermined operating points in the operation of the turntable and altering the states of the storages in dependence thereon; and a touch-activated lift-tone-arm switch operative when touched by the user for transmitting an activating signal to the lift means and also altering the state of at least one of the storages.

4,132,936

CONDENSATE DISCHARGE APPARATUS

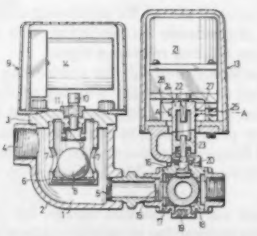
Katsuji Fujiwara, 191, Nishitani, Hiraoka-cho, Kakogawa-shi, Hyogo-ken, Japan

Continuation of Ser. No. 479,542, Jun. 14, 1974, abandoned. This application Mar. 15, 1976, Ser. No. 666,909

Claims priority, application Japan, Jun. 20, 1973, 48-073694

Int. Cl.[2] H02H *7/08*

U.S. Cl. 318—482 **1 Claim**



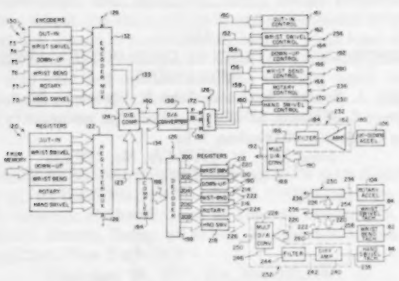
1. Apparatus for discharging condensate from a condensate sump comprising a housing defining said sump with an upper portion and providing an inlet and an outlet for said sump, a float arranged within said sump, said float being formed with a generally spherical configuration having a continuous unbroken outer surface and arranged in said sump in a substantially free floating state detached from any other parts of said appara-

tus, electrically driven valve means located at the outlet of said sump operative to control discharge of condensate therefrom, proximity switch means controlling operation of said valve means for periodically discharging condensate from said sump, sensor means located in the upper portion of said sump directly above said float for sensing the position relative thereto of said float and for actuating said proximity switch means in accordance with the proximity of said float to said sensor means, said sensor means being operative to effect activation of said valve means in accordance with the location of said float relative to a predetermined distance from said sensor means, and a seat member for said float arranged to prevent abutment of said float against said sensor means but permitting movement of said float at least to within said predetermined distance, said housing being configured to define said sump to include generally vertically upstanding inner wall means surrounding said float, said inner wall means being dimensioned to maintain a horizontal spacing between said float and said wall means to enable said float to freely move vertically therein beneath said sensor means and into abutment with said seat member in accordance with the level of condensate within said sump while maintaining said float in sufficient vertical alignment with said sensor means to enable said sensor means to effect sensing of the proximity thereto of said float, said proximity switch means operating to open and close said valve means in response to said sensor means to effect condensate discharge in accordance with the level of condensate within said sump.

4,132,937
PROGRAMMABLE MANIPULATOR WITH DYNAMIC FEEDBACK APPARATUS FOR STABILIZATION

Joseph F. Engelberger; Maurice J. Dunne, both of Newtown, and Peter F. Rogers, Bethel, all of Conn., assignors to Unimation, Inc., Danbury, Conn.

Filed Oct. 18, 1976, Ser. No. 732,977
Int. Cl.[2] G05B *11/18*
U.S. Cl. 318—568 **26 Claims**

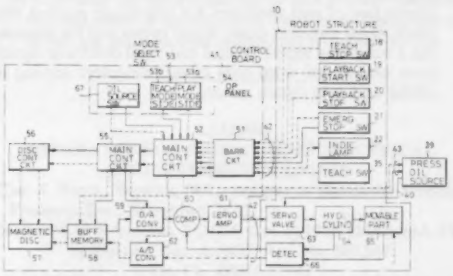


1. In a programmable manipulator, the combination of,
a manipulator arm,
means for moving said arm to different positions in a plurality of independent axes,
memory storage means for storing digital representations corresponding to different positions of said arm in said axes,
encoder means for each of said axes and operative to develop position signals corresponding to the actual position of said arm in said plurality of axes,
comparing means for comparing command and position signals and developing an error signal related to the difference therebetween,
means for sensing the acceleration in at least one of said independent axes at a location on said manipulator arm closer to the outer end of said manipulator arm than the location at which the encoder for said axis measures positional data and for generating a dynamic feedback signal related to the acceleration in said axis, and
means for combining said error signal and said dynamic feedback signal to control said moving means.

4,132,938
PLAYBACK TYPE INDUSTRIAL ROBOT

Sinitiro Sano, Yokohama; Noriaki Kuroda, Omiya, and Tsuyoshi Sakai, Yokohama, all of Japan, assignors to Tokico Limited, Kawasaki, Japan

Filed Apr. 1, 1977, Ser. No. 783,727
Claims priority, application Japan, Apr. 19, 1976, 51-44812
Int. Cl.[2] G05B *19/42*
U.S. Cl. 318—568 **7 Claims**



1. An industrial robot comprising: a robot structure having a movable part; driving means for driving said movable part; detection means for detecting substantially a displacement of said movable part and for generating a position detection signal; memory means for memorizing the signal from said detection means and reading out the signal thus memorized; control means for controlling a memorizing operation and reading out operation of said memory means and for controlling said driving means responsive to the signal read out from said memory means; teaching mode operation means which is manipulated to assume a teaching operation mode and applies a teaching mode signal to said control means, said control means being responsive to said teaching mode signal and producing a signal for causing said memory means to memorize and a signal for controlling said driving means so as to be noload with respect to said movable part; normal playback mode manipulation means which is manipulated so as to assume a normal playback operation mode and applies a playback mode signal to said control means, said control means being responsive to said playback signal and producing a signal for causing said memory means to perform a reading out operation and a signal for causing said driving means to make an operational state; another playback mode manipulating means which is manipulated so as to assume a playback operation during the teaching mode exclusively and applies a playback mode signal to said control means prior to the teaching mode signal; and playback stop means which is manipulated to stop said playback operation temporarily during the teaching mode and applies a playback stop signal to said control means, said control means being responsive to said playback stop signal and sending to said memory means a signal for stopping the reading out operation thereof, said memory means, after a stop of playback, continuing to memorize the signal from said detection means following the memorized signal preceding to the stop of playback in the teaching operation mode.

4,132,939
DRIVING SIGNAL CONTROL CIRCUIT

Masayoshi Kameyama, Sagamihara; Hiroshi Horiguchi, Kawagoe, and Kazuo Ichino, Tokyo, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jul. 21, 1977, Ser. No. 817,746
Claims priority, application Japan, Jul. 23, 1976, 51-87290
Int. Cl.[2] G05G *5/00*
U.S. Cl. 318—627 **11 Claims**

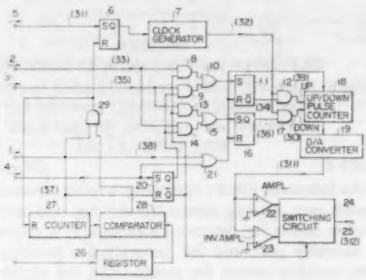
1. A driving signal control circuit for controlling a table of a machine tool in which the table is mounted so as to be recip-

rocated by drive means, and in which a workpiece mounted on the table can be worked, comprising

clock generator means for generating a clock pulse signal;

detector means including at least four detectors positioned with respect to said table so as to detect the presence of said table at four respective positions as it is reciprocated;

gate circuit means responsive to a first detecting signal derived from a first one of said detectors for selectively passing said clock signal pulses as up signal pulses and responsive to a fourth detecting signal derived from a fourth one of said detectors for selectively passing said clock signal pulses as down signal pulses and for generating a switching signal, second and third detecting signals from second and third ones of said detectors serving to inhibit said gate circuit means;



counter means for adding said up signal pulses and for subtracting said down signal pulses derived from said gate circuit means;

converter means for converting a digital output signal derived from said counter circuit means into an analog signal;

switching circuit means responsive to the output of said converter means for generating a driving signal with negative polarity or positive polarity corresponding to the switching signal derived from said gate circuit means;

whereby the table can be smoothly reciprocated by said driving means responsive to said driving signal without generating a mechanical vibration in the table when it is started, stopped and reversed in direction of movement.

4,132,940

APPARATUS FOR PROVIDING A SERVO DRIVE SIGNAL IN A HIGH-SPEED STEPPING INTERFEROMETER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Rudolf A. Schindler, Sierra Madre, Calif.

Continuation of Ser. No. 565,162, Apr. 4, 1975, abandoned. This application Jun. 6, 1977, Ser. No. 804,035

Int. Cl.[2] G05B *1/06*

U.S. Cl. 318—640 **8 Claims**

1. Apparatus for precisely and rapidly changing the optical path difference in a stepping interferometer, having at least one moving retroreflector, wherein a reference light source, having a known wavelength, is utilized for the generation of a reference fringe pattern, said apparatus comprising

means for applying an offset voltage to said moving retroreflector, said voltage being representative of a change in the optical path difference in said interferometer from a present null position to a new null position;

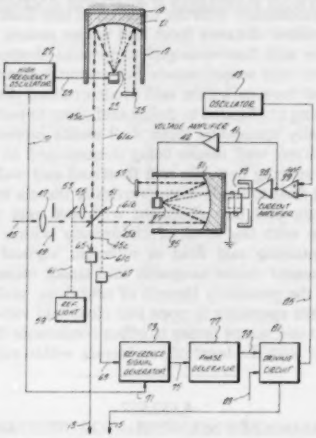
means for sensing said reference fringe pattern as a sinusoidal signal;

means responsive to said sensed sinusoidal signal for generating a voltage signal indicative of the degree of movement occurring in the optical path difference of said interferometer as a result of the applied offset voltage;

means for reducing said offset voltage according to the voltage signal generated by said sinusoidal signal responsive means;

means responsive to said sinusoidal signal for generating a plurality of sinusoidal signals displaced in phase by an even fractional portion of the sensed sinusoidal signal;

means responsive to less than all of said plurality of phase-displaced sinusoidal signals for generating a plurality of switching signals; and



means responsive to said switching signals for sequentially passing selected portions of said plurality of phase-displaced sinusoidal signals to the input of said applying means, whereby said offset voltage is linearly reduced until the offset voltage is essentially zero when the new null position is reached.

4,132,941

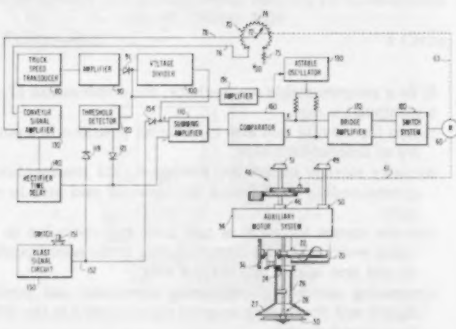
SYNCRO-MATIC CIRCUIT USED WITH MATERIAL SPREADERS

Eugene A. Sousek, Appleton; John R. Stroemer, Neenah, and Steven L. Whitsitt, Middleton, all of Wis., assignors to Koehring Company, Milwaukee, Wis.

Filed Mar. 16, 1977, Ser. No. 778,133

Int. Cl.[2] G05B *1/06*

U.S. Cl. 318—663 **13 Claims**



1. In a mobile material spreader including a prime mover, a material storage means associated with the prime mover, a material spreading means for spreading material during movement of the prime mover, control means for controlling the spreading rate of the material spreading means in accordance with the prime mover speed of movement, the improvement comprising:

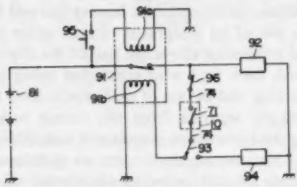
manually operable control over-ride means for automati-

cally increasing the spreading rate of the spreading means from a base rate to a previously selected increased rate, for automatically maintaining said increased rate for a preselected interval of time and for automatically returning to said base rate after said interval of time.

4,132,942
DEVICE FOR DETECTING THE OVERDISCHARGE OF BATTERY

Mitsuo Yamamoto, Kakegawa, Japan, assignor to Ishikawa Tekko Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 688,688, May 21, 1976, Pat. No. 4,055,708. This application Jun. 29, 1977, Ser. No. 811,052
Claims priority, application Japan, May 27, 1975, 50-63612; Jan. 16, 1976, 51-4373
Int. Cl.² H02J 7/14; H03G 3/00
U.S. Cl. 320—13 **17 Claims**

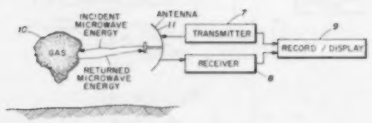


1. In a control circuit for an accumulator which is adapted to supply an electrical load and to be employed with a prime mover;
first means for controlling energization of said load from said accumulator;
second means for providing a warning signal;
third means responsive to the operative condition of said prime mover;
and fourth means responsive to a fault condition in said accumulator, said third and fourth means cooperating when a fault condition occurs in said accumulator to cause said first means to prevent energization of said load when said prime mover is inoperative and to enable energization of said load and operation of said warning signal when said prime mover is operative.

4,132,943
REMOTE SENSING OF HYDROCARBON GAS SEEPS UTILIZING MICROWAVE ENERGY

Luke S. Gournay, Rockwall; John W. Harrell, Duncanville, and Charles L. Dennis, Dallas, all of Tex., assignors to Mobile Oil Corporation, New York, N.Y.

Filed Apr. 18, 1977, Ser. No. 788,394
Int. Cl.² G01V 3/12
U.S. Cl. 324—6 **10 Claims**

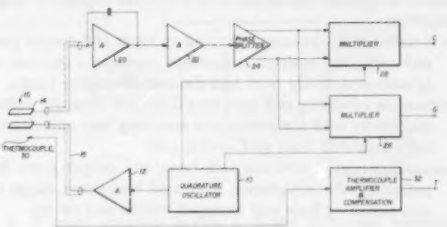


1. A method for identifying gas seeps in the atmosphere, comprising the steps of:
(a) repetitively transmitting microwave energy pulses of a first frequency into the atmosphere through a given radiation pattern, each microwave energy pulse that irradiates a gas seep located within said radiation pattern excites said gas seep to emit a microwave energy pulse at a second frequency characteristic of a molecular resonance of the particular species of gas,
(b) receiving microwave energy pulses at said second frequency emitted by gas seeps located within said radiation pattern,
(c) producing a video signal for each of said received microwave energy pulses,
(d) determining the average amplitude of all of said video signals received from gas seeps located within said radiation pattern,
(e) determining a count of the number of said video signals received from gas seeps located within said radiation pattern, and
(f) recording the determinations of said average amplitude and said count as indications of the concentration and size of the gas seeps located within said radiation pattern.

4,132,944
APPARATUS FOR MONITORING ELECTRICAL PROPERTIES OF A LIQUID

Allan J. Bentz, Norwich, N.Y., assignor to Simmonds Precision Products, Inc., Tarrytown, N.Y.

Continuation of Ser. No. 730,616, Oct. 7, 1976, abandoned. This application Dec. 2, 1977, Ser. No. 857,347
Int. Cl.² G01N 27/42
U.S. Cl. 324—30 R **7 Claims**

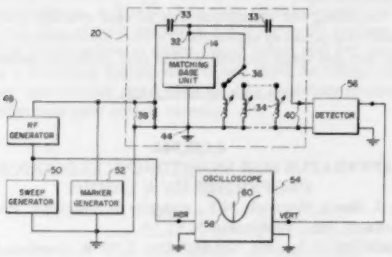


1. Monitoring apparatus for continuously determining at least one electrical characteristic of a liquid at a preselected reference temperature during processing of the liquid at a processing temperature which can vary from the reference temperature, which comprises:
probe means immersed in a liquid undergoing chemical processing for producing a current representing the electrical admittance of the liquid;
thermocouple means immersed in the liquid for producing a voltage representing the processing temperature of the liquid being monitored;
first signal resolution means connected to said probe means for producing, from said admittance current, a voltage representing the electrical conductance of the liquid at said processing temperature;
voltage generating means for producing a voltage corresponding to a reference temperature, said reference temperature voltage being equal and opposite to the processing temperature voltage produced by said thermocouple means when the reference temperature is equal to the processing temperature;
voltage summing means connected to said thermocouple means and to said voltage generating means for producing a temperature difference voltage representing the difference between said reference temperature voltage and said processing temperature voltage;
temperature compensation means connected to said summing means and to said first signal resolution means for modifying said voltage representing the conductance of the liquid at the processing temperature, to produce an output voltage representing the conductance of the liquid at the reference temperature.

4,132,945
SYSTEM FOR ALIGNING WHIP ANTENNA MATCHING BASE UNITS

Peter E. Cunningham, Ocean, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 27, 1977, Ser. No. 864,885
Int. Cl.[2] G01R 27/04
U.S. Cl. 324—58 C 12 Claims



1. A system for setting the admittances of a whip antenna matching base unit having multiple adjustable shunt reactances adapted to operate selectively over a discrete frequency range comprising:

a metallic cavity resonator having an input and output port and including multiple adjustable reactances adapted to operate selectively over said discrete frequency range,

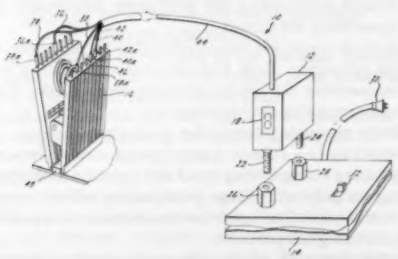
means for mounting said matching base unit centrally within said cavity with one end of said matching base unit electrically insulated from said cavity; and

means connected between said input and output ports for indicating the admittance over said frequency range of said matching base unit mounted within said cavity.

4,132,946
DIGITAL READOUT TEST PROBE

Earl J. Hoidren, Windsor, Canada; Peter Polasek, Grosse Pointe, and Thaddeus W. Krzys, Jr., Troy, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Jan. 19, 1976, Ser. No. 650,331
Int. Cl.[2] G01R 31/02, 19/16
U.S. Cl. 324—73 R 7 Claims



6. A digital readout test probe for displaying a decimal number representation of binary signals appearing at selected test points in a circuit under test comprising:

a digital readout decimal display for visibly displaying decimal numbers;

a connector means for making connection with the selected test points of the circuit under test;

a converter circuit having an input adapted to receive the binary signals and an output operatively coupled with said display, said converter circuit comprising means for causing said display to show a decimal number representation of the binary signals at its input;

and means operatively coupling the input of said converter circuit with said connector means comprising a plurality of individual lead wires, each of which is uniquely coded, and each of which is connected, via a corresponding individual conductor of said connector means, with a corresponding one of the selected test points of the circuit under test, each lead wire terminating in a connector which is matingly engaged with the corresponding individual conductor of said connector means and which may be manually disengaged therefrom and matingly engaged with another individual conductor of said connector means;

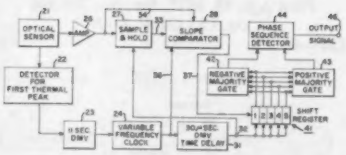
wherein said connector means comprises a dual in-line clip-type connector for making connection with a dual in-line pin type integrated circuit, said individual conductors of said connector means being arranged in a dual in-line configuration, each conductor having one end for connection to a pin of an integrated circuit under test and its other end projecting above the half of the clip on which it is disposed, each lead wire connector being mated with the projecting end of one of said conductors; and

a power supply separate from the circuit under test for powering said converter circuit and said display without powering the circuit under test so that essentially all power draw for said converter circuit and said display is from said power supply and essentially zero power draw is from the circuit under test.

4,132,947
WAVESHAPE DETECTOR

Richard C. Weischedel, Camillus, N.Y., and Gerald Carp, Potomac, Md., assignors to General Electric Company, Syracuse, N.Y.

Filed Sep. 6, 1967, Ser. No. 667,622
Int. Cl.[2] G01R 23/16, 27/02
U.S. Cl. 324—77 A 10 Claims

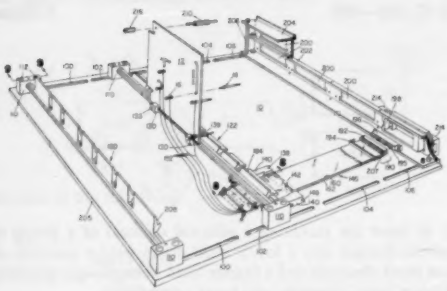


1. A waveshape detector having means to repetitively sample the slope of an electrical wave and provide signals indicative of said slope, and means for comparing said slope signals to determine a change in slope of said wave, wherein the improvement comprises storage means for storing at least some of said slope signals and output means connected to said storage means and adapted to determine when a certain number of slope signals indicating a given slope are contained in said storage means.

4,132,948
TEST FIXTURE USING STOCK PRINTED CIRCUIT BOARD HAVING TEST PINS MOUNTED THEREON

Jonathon H. Katz, Brookline, Mass., assignor to Teradyne, Inc., Boston, Mass.

Filed Mar. 17, 1977, Ser. No. 778,505
Int. Cl.² G01R *31/02, 15/12*
U.S. Cl. 324—158 F **10 Claims**



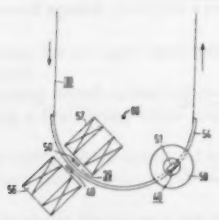
1. A test fixture for testing the electrical integrity of a first board of insulating material having a particular hole pattern and bearing printed circuit conductors and electrical components forming a loaded printed circuit board comprising:

a second board of insulating material identical to the first board of insulating material, said second board of insulating material bearing holes having an identical hole pattern to that of the first board of insulating material, said second board bearing printed circuit conductors of a configuration identical to that of the first board of insulating material, test pins being mounted in said holes of said second board of insulating material to thereby correspond spacially with test points on the loaded printed circuit board, the second board being derived from stock having holes and printed circuit conductors for producing the loaded printed circuit board.

4,132,949
METHOD AND APPARATUS FOR THE CONTINUOUS, CONTACTLESS TESTING OF AN ELONGATED CONDUCTOR WHICH CONSISTS AT LEAST PARTIALLY OF SUPERCONDUCTIVE MATERIAL

Günter Rupp, Nüremberg, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Jan. 21, 1977, Ser. No. 760,988
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1976, 2606504
Int. Cl.² G01R *33/12*
U.S. Cl. 324—224 **3 Claims**

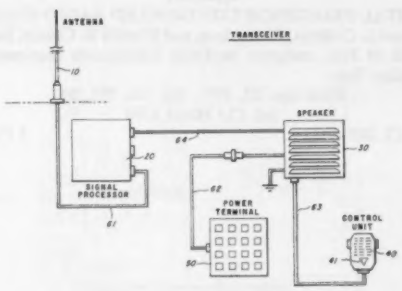


1. A method for the continuous, contactless testing of a long conductor which consists at least partially of superconductive material comprising moving the conductor, with its superconductive material in the superconducting state, through an external magnetic field which induces shielding currents in the superconductor material, and measuring the magnetic field produced by shielding currents by measuring means, wherein the improvement comprises carrying out the step of moving by moving the conductor through an external and at least approximately homogenous magnetic field comprising at least two spatially separated magnetic field regions disposed one behind the other in the lengthwise direction of the conductor, the fields of which have different flux densities and are angularly displaced about the longitudinal axis of the conductor through a predetermined angle with respect to each other in the circumferential direction, said measuring means of each magnetic field measuring independently with respect to each other.

4,132,950
CLARIFYING RADIO RECEIVER

Michael J. Cochran, Richardson, and Edward R. Caudel, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 27, 1977, Ser. No. 791,629
Int. Cl.² H04B *1/40*
U.S. Cl. 325—25 **8 Claims**



1. A radio receiver having a digital processor controlled signal clarifier, said radio receiver comprising:

(a) mixer means having inputs coupled to simultaneously receive (1) input signals comprised of a plurality of spaced apart frequency channels and (2) mixing frequency signals of a first selectable frequency, for generating in response thereto, output signals in which said input signal is shifted in frequency such that the center frequency of a selected one of said frequency channels is shifted to a predetermined frequency;

(b) mixing frequency generator means having inputs coupled to receive first digital coded signals identifying said first selectable frequency for generating said mixing frequency signals of said first selectable frequency in response thereto;

(c) a charge transfer device transversal filter means having a selectively controllable passbandwidth centered about a finely tuneable center frequency, said filter means being coupled to said mixer means for defining a selected frequency band of said output signals to pass only said selected frequency band of said selected one of said frequency channels, said filter being coupled to receive simultaneously with said output signals, filter clocking signals of a second selectable frequency, said filter means being responsive to said filter clocking signal for controlling the passbandwidth and finely tuneable center frequency of said filter means in response to the frequency of said clocking signal;

(d) filter clocking signal generator means having inputs coupled to receive second digital coded signals identifying said second selectable frequency for generating said filter clocking signals of said second selectable frequency in response thereto;

(e) keyboard means having a plurality of channel selection keys, at least one band selection key and at least one clarify key; and

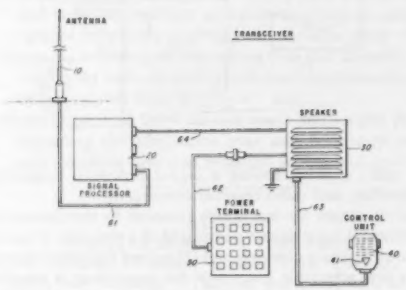
(f) digital processor means coupled to said keyboard means and to said mixing frequency and filter clocking signal generators, said digital processor means being responsive to actuation of said channel selection keys for generating said first digital coded signals, being responsive to activation of said at least one band selection key for computing the passbandwidth and center frequency of said filter means and for generating said second digital coded signals in accordance with the computed passbandwidth and center frequency and being responsive to said at least one clarify key for altering the computed center frequency of said filter means in fine increments and for generating said second digital coded signals in accordance with the altered center frequency.

4,132,951

DIGITAL PROCESSOR CONTROLLED RADIO SYSTEM

Michael J. Cochran, Richardson, and Edward R. Caudel, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 27, 1977, Ser. No. 791,254
Int. Cl.² H04B 1/06
U.S. Cl. 325—452 **4 Claims**



1. A digital processor controlled signal processor comprising:

(a) a charge transfer device transversal filter means having a selectively controllable passbandwidth centered about a finely tuneable center frequency, said filter means being coupled to simultaneously receive: (1) filter input signals comprised of a plurality of frequency bands which lie within a selected one of a plurality of non-overlapping frequency channels, and (2) a filter clocking signal of a selectable frequency f_{s1}, said filter means being responsive to said filter clocking signal for controlling the passbandwidth and center frequency of said filter means in response to the frequency of said clocking signal;

(b) a first phase lock loop clocking means having (1) an input for receiving a reference frequency f_r and (2) a feedback loop comprised of a first programmable counter means responsive to digital coded programming signals for generating in response thereto a variable count N_1;

(c) a second programmable counter means of variable count N_2 responsive to said digital coded programming signals coupled to said clocking means for generating said filter clocking signals at said selectable frequency f_{s1} where $f_{s1} = f_r(N_1/N_2)$; and

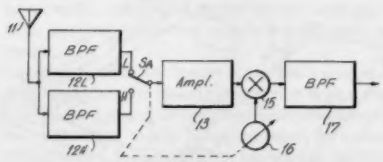
(d) digital processor means responsive to logical control signals for computing the passbandwidth and center frequency of said filter means and for generating said digital coded programming signals in accordance therewith.

4,132,952

MULTI-BAND TUNER WITH FIXED BROADBAND INPUT FILTERS

Masayuki Hongu, Komae; Tsutomu Niimura, Hiratsuka, and Hiromi Kawakami, Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 739,276, Nov. 5, 1976, abandoned. This application Jan. 31, 1978, Ser. No. 873,963
Claims priority, application Japan, Nov. 11, 1975, 50-135500
Int. Cl.² H04B 1/10
U.S. Cl. 325—459 **7 Claims**



1. A tuner for receiving a selected channel of a group of channels divided into a lower band comprising a plurality of lower band channels and a higher band comprising a plurality of higher band channels, said tuner comprising:

first filter means having a fixed pass band tuned to pass said lower band;

second filter means having a fixed pass band tuned to pass said higher band;

switching means connected to said first and second filter means to provide a signal path through a selective one of said first and second filter means;

a mixer connected to said signal path to receive the output signal thereof;

a local oscillator connected to said mixer to supply thereto a frequency-converting signal to convert the frequency of said selected channel to an intermediate frequency band having a lowest frequency f_L determined by the following conditions when the frequency of the frequency-converting signal is higher than the highest frequency of a selected channel:

$$f_L > \frac{f_S - f_P - f_B}{2}$$

and

$$f_L > \frac{f_W - f_T - f_B}{2}$$

and one of the following:

$$f_L < \frac{2f_P - f_S - f_B}{2}$$

or

$$f_L > \frac{2f_S - f_P - f_B}{2},$$

and one of the following:

$$f_L < \frac{2f_T - f_W - f_B}{2}$$

or

$$f_L > \frac{2f_W - f_T - f_B}{2},$$

and the lowest frequency f_L in the intermediate frequency band is determined by the following conditions when the frequency of the frequency-converting signal is lower than the lowest frequency of a selected channel:

$$f_L > f_S - f_B - f_P$$

and

$$f_L < f_T - f_S$$

and

$$f_L > f_W - f_B - f_T$$

and one of the following:

$$f_L > \frac{f_S - f_B}{2}$$

or

$$f_L < \frac{2f_P - f_S - f_B}{2}$$

and one of the following:

$$f_L > \frac{F_W - f_B}{2}$$

or

$$f_L < \frac{2f_T - f_W - f_B}{2}$$

where:
f_B is the bandwidth of each channel,
f_P is the lower frequency in the lower band,
f_S is the higher frequency in the lowest band,
f_T is the lowest frequency in the highest band, and
f_W is the highest frequency in the higher band.

4,132,953

SQUELCH CIRCUIT FOR A RADIO RECEIVER

Robert J. Martin, III, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Sep. 29, 1977, Ser. No. 838,007
Int. Cl.[2] H04B *1/10*
U.S. Cl. 325—478 **9 Claims**

1. An improved squelch circuit for a radio receiver comprising:

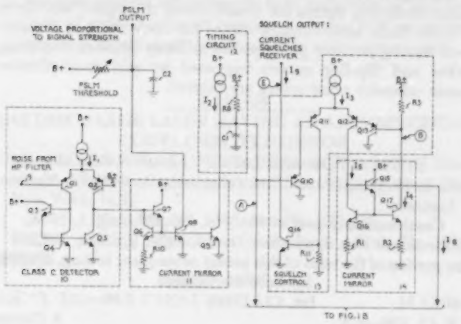
a. input means for an input signal indicative of a received radio signal;

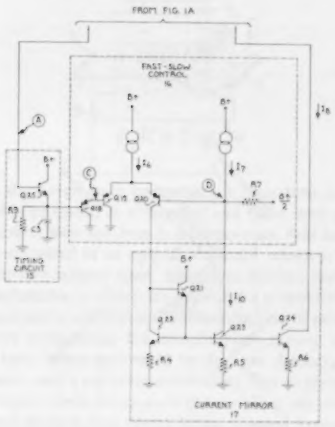
b. a first timing circuit connected to said input means for producing a first timing signal responsive to said input signal;

c. a second timing circuit connected to said input means for producing a second timing signal responsive to said input signal;

d. a squelch circuit having an input connected to said first timing circuit, having a threshold circuit for providing a first threshold signal, and having a squelch output for producing an unsquelch signal in response to said first timing signal being greater than said first threshold signal and for producing a squelch signal in response to said first timing signal being less than said first threshold signal;

e. and a control circuit having an input connected to said second timing circuit, and having a control output connected to said threshold circuit of said squelch circuit for





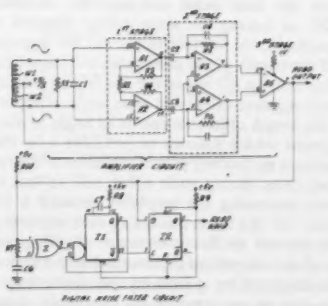
raising said first threshold signal in response to said second timing signal rising above a selected level.

4,132,954

NOISE SUPPRESSION CIRCUIT ADAPTED FOR USE WITH BIFILAR WINDINGS

Pawitter S. Sidhu, Los Angeles, Calif., assignor to Micro Peripherals, Inc., Sepulveda, Calif.

Filed Aug. 26, 1977, Ser. No. 827,882
Int. Cl.[2] H03K *5/00*
U.S. Cl. 328—165 **8 Claims**



8. A noise suppression circuit means for suppressing signal noise in a circuit, in combination, differential amplifier means

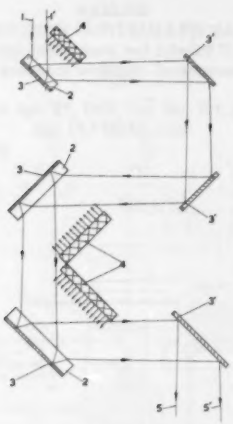
for filtering signal noise components and means for converting a filtered signal to digital form having residual noise appearing in the signal in the form of spikes, digital noise filter circuit means including means for transforming the signal waveform to spike form, multivibrator means for converting to a waveform having positive going pulses midway between incoming spikes and flip-flop means triggered by said multivibrator means whereby noise spikes are filtered.

4,132,955

SYSTEM FOR AMPLIFYING LASER BEAMS

John L. Hughes, Aranda, Australia, assignor to Helen Hughes, Australia

Continuation-in-part of Ser. No. 493,570, Aug. 1, 1974, abandoned. This application Dec. 7, 1976, Ser. No. 748,316
The portion of the term of this patent subsequent to Aug. 2, 1994, has been disclaimed.
Int. Cl.[2] H01S *3/091*
U.S. Cl. 330—4.3 **8 Claims**



1. A uni-directional laser amplifier system utilizing a diverged, laser beam whose diameter exceeds twenty cm., composed of either a single, unstructured pulse, or a train of such pulses, amplified to a level in excess of one terrawatt peak power over folded amplification path of at least fifty meters emerging via an elliptical cross-section aperture, whose major axis exceeds twenty centimeters the system comprising:

(a) two rows spaced at least ten meters apart of amplifying segments of elliptical and progressively increasing cross-sectional area each segment possessing two optically polished, non-parallel, flat end surfaces with the front surface of each segment being anti-reflection coated and its rear surface having either a mirror deposited on it which reflects the laser beam and segment excitation radiation 100% or having the same mirror attached to it and/or separated from the rear surface of the segment by at least half the length of the laser pulse to be amplified so that no pulse overlap occurs in the amplifying medium;

(b) each segment orientated at an angle of approximately 45° to the length of its row and at an angle of about 90° to the segment which follows or precedes it in the amplifying sequence so that any pair of segments in the row with their front faces facing each other will reflect the diverged beam traversing the amplifier through a total angle of about 180° the beam traversing each segment twice during this process so that it emerges travelling approximately parallel to its path of incident but in the opposite direction and displaced by at least its own diameter in such a manner that it can traverse all remaining segments of the amplifier system;

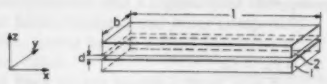
(c) optical excitation sources for sequential excitation of amplifying segments positioned between the two rows of segments such that each source is positioned parallel to the input surface of its respective segment, at such a distance as not to interfere with the laser beam path, so that its output radiation enters the amplifier segment where it can be partially (or wholly) absorbed and the remainder is wholly reflected by the mirror deposited on the rear surface of the segment so as to increase its absorption efficiency in the laser medium.

4,132,956

CIRCUIT ARRANGEMENT FOR AMPLIFYING HIGH FREQUENCY ELECTROMAGNETIC WAVES

Peter Russer, Ulm, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 28, 1978, Ser. No. 891,145
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1977, 2713820
Int. Cl.[2] H03F *7/06*
U.S. Cl. 330—5 **12 Claims**



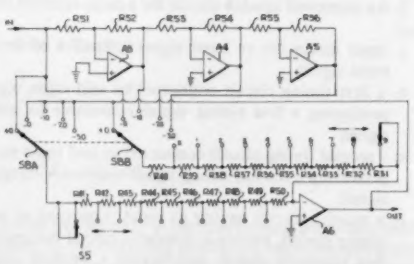
1. A circuit for amplifying high frequency electromagnetic waves, comprising: means defining a Josephson junction composed of two weakly coupled superconductor bodies and constituting an electromagnetic high frequency line along which electromagnetic waves can propagate at a signal frequency and at least one idler frequency; means connected for applying a direct voltage between said bodies for supplying pumping energy thereto; and means disposed for establishing a transversal magnetic field between said bodies; whereby the Josephson current between said bodies is modulated with respect to time by the direct voltage and with respect to space by the magnetic field to cause the Josephson current to present a phase wave which meets the frequency and wave number conditions for amplification of at least one such high frequency electromagnetic wave.

4,132,957

PROGRAMMABLE AMPLIFIER

Norris C. Hekimian, Rockville, and Chong-Soo Kim, Gaithersburg, both of Md., assignors to Hekimian Laboratories, Inc., Rockville, Md.

Filed Oct. 26, 1977, Ser. No. 845,668
Int. Cl.[2] H03G *3/02*
U.S. Cl. 330—51 **8 Claims**



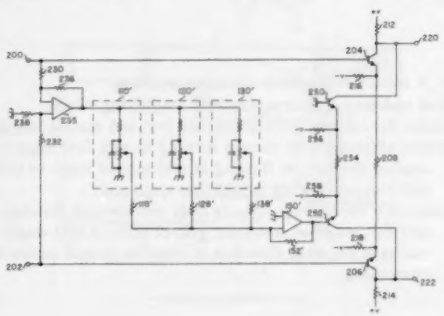
6. An adjustable gain circuit in which the gain is adjustable unambiguously over a range which extends above and below 0 dB, said circuit comprising:

a circuit input terminal;

a circuit output terminal;
an inverting operational amplifier having an inverting input terminal and an output terminal;
means connecting said amplifier output terminal to said circuit output terminal;
first and second adjustable impedance means;
first operator-actuable switch means having at least first and second positions designated +0 dB and −0 dB, respectively, said switch means being operative in one of said positions to connect said first adjustable impedance means in series between said circuit input terminal and said inverting input terminal and to connect said second adjustable impedance means in series between said operational amplifier output terminal and said inverting input terminal, said switch means being operative in the other of said positions to connect said first adjustable impedance means in series between said operational amplifier output terminal and said inverting input terminal and to connect said second adjustable impedance means in series between said circuit input terminal and said inverting input terminal;
second operator-actuable switch means, having plural positions calibrated in equal dB increments, for selectively adjusting the impedance of said first adjustable impedance means in predetermined impedance steps such that the gain of said amplifier changes by one of said equal dB increments for each impedance step change; and
third operator-actuable switch means, having plural positions calibrated in equal dB increments, for selectively adjusting the impedance of said second adjustable impedance means in predetermined impedance steps such that the gain of said amplifier changes by one of said equal dB increments for each impedance step change.

4,132,958
FEEDBESIDE CORRECTION CIRCUIT FOR AN AMPLIFIER

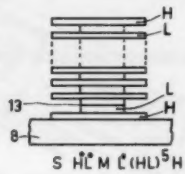
John L. Addis, Portland, and Bruce E. Hofer, Beaverton, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.
Filed Oct. 31, 1977, Ser. No. 846,744
Int. Cl.² H03F *3/45*
U.S. Cl. 330—252 **6 Claims**



1. An amplifier having a correction circuit, comprising:
input terminal means for receiving an input signal;
a first wideband differential amplifier coupled to said input terminal means to receive said input signal and produce an output signal therefrom, said first differential amplifier including a first pair of emitter coupled transistors having a pair of output collectors;
correction circuit means coupled to said input terminal means, said correction circuit means being responsive to said input signal for generating a correction signal only when the frequency of said input signal is within a predetermined frequency band;
a second differential amplifier coupled to said correction circuit means, said second differential amplifier including a second pair of emitter coupled transistors having a pair of output collectors; and
means for coupling both collectors of said second pair of emitter coupled transistors to both collectors of said first pair of emitter coupled transistors so that said correction signal is algebraically summed with said output signal.

4,132,959
GAS DISCHARGE LASER HAVING AN ASYMMETRICAL COUPLING-OUT MIRROR

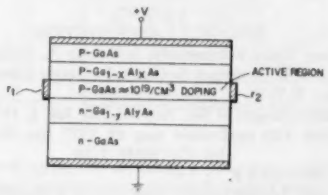
Gijsbertus Bouwhuis, and Johannes van der Wal, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Aug. 11, 1976, Ser. No. 713,515
Claims priority, application Netherlands, Jun. 21, 1976, 7606693
Int. Cl.² H01S *3/00*
U.S. Cl. 331—94.5 C **14 Claims**



1. A gas discharge laser comprising a laser tube having a longitudinal bore sealed at either end and filled with a gas in which an active laser medium is incorporated, said laser medium being activated in an optical resonator which is formed from at least two spaced apart multilayer mirrors each composed of a substrate on which are provided a number of layers having a high and a low index of refraction, one of said multilayer mirrors comprising the coupling-out mirror through which the laser beam generated by the gas discharge laser leaves the laser, and a radiation-attenuating film element incorporated between a pair of layers of the coupling-out mirror, at least one and at most five layers being situated between the radiation-attenuating film element and the substrate.

4,132,960
SINGLE LONGITUDINAL MODE GAAS/GAALAS DOUBLE HETEROSTRUCTURE LASER

William Streifer, Palo Alto; Donald R. Scifres, Los Altos, and Robert D. Burnham, Los Altos Hills, all of Calif., assignors to Xerox Corporation, Stamford, Conn.
Filed Mar. 28, 1977, Ser. No. 781,612
Int. Cl.² H01S *3/19*
U.S. Cl. 331—94.5 H **1 Claim**



1. In a solid state, heterostructure diode laser having an active region layer, confinement layers bordering the active region layer, and means for providing a resonant cavity, at least one of the confinement layers having a lower refractive index than the refractive index of the active region layer and one of the confinement layers being doped differently than the

active region layer to provide a rectifying junction, the improvement comprising:

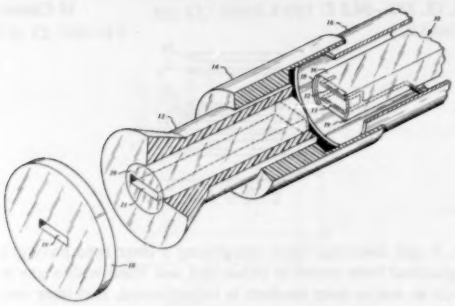
restricting the output of the laser when the rectifying junction is sufficiently forward biased to a single longitudinal mode by doping the laser active region with zinc to a doping concentration density of approximately $10^{19}/cm^3$ and doping said confinement layers to a dopent concentration density of approximately $5\times10^{17}/cm^3$.

4,132,961

GASEOUS DISCHARGE STABILIZATION APPARATUS AND METHOD

Richard C. Bergman, Corfu, N.Y., assignor to Calspan Corporation, Buffalo, N.Y.

Filed Mar. 31, 1977, Ser. No. 783,111
Int. Cl.² H01S *3/097*
U.S. Cl. 331—94.5 PE **9 Claims**



1. In an electrically excited flowing gas laser, gaseous discharge stabilization apparatus including:

a discharge tube having a first end and a second end;

a passageway in said discharge tube having a rectangular cross sectional area;

a high pressure mixture of laser gases upstream of said passageway;

anode injector means, including at least one anode means, located exteriorly of said passageway and coacting with said first end of said discharge tube to define a plurality of radially extending restrictions communicating with said passageway for causing the high pressure gases to be injected at sonic velocity over said at least one anode means and transversely into said discharge tube;

cathode means coacting with said second end of said discharge tube to define an expansion throat;

a source of DC current operatively connected to said at least one anode means and said cathode means;

thereby resulting in increased turbulence which permits an increased discharge current, discharge pressure and concentration of laser gases.

4,132,962

TUNABLE LASER SYSTEM

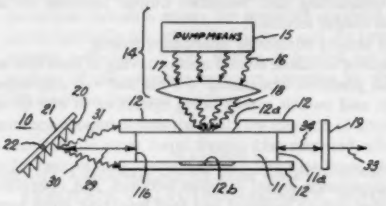
Kei-Hsiung Yang, Schenectady, and John A. DeLuca, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 703,093, Jul. 6, 1976, Pat. No. 4,083,018. This application Aug. 10, 1977, Ser. No. 823,382
Int. Cl.² H01S *3/16*
U.S. Cl. 331—94.5 F **9 Claims**

1. A laser system tunable over one of a plurality of wavelength ranges in the over-all wavelength range of about 2760 angstroms to about 3220 angstroms, comprising:

a crystal of a host material containing the fluoride of at least a Column III*b* metal and having the lattice thereof activated by trivalent cerium;

excitation means for pumping said crystal with energy having wavelengths between about 1900 angstroms and about 2600 angstroms in the ultraviolet region of the electromagnetic spectrum to cause said crystal to fluoresce over the selected wavelength range; and



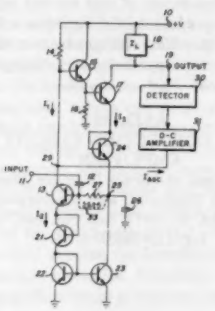
optical means comprising an optical cavity and including means for selecting a particular wavelength within said selected wavelength range.

4,132,963

GAIN CONTROLLED SIGNAL AMPLIFIER

Ronald W. Page, Sunnyvale, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Nov. 14, 1977, Ser. No. 851,014
Int. Cl.² H03G *3/30*
U.S. Cl. 330—283 **11 Claims**



1. A transistor amplifier circuit comprising:

first and second common emitter amplifying stages,

means for cascade connecting said first and second stages,

means responsive to current flowing in said first stage for causing the current flowing in said second stage to track said current flowing in said first stage and

means for controlling directly only said current flowing in said first stage whereby the gain of both of said stages is varied in the same direction in response to said means for controlling.

4,132,964

NON-LINEARITY CORRECTION IN WIDE RANGE VOLTAGE CONTROLLED OSCILLATORS

Milton E. Wilcox, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

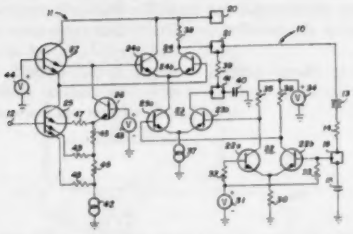
Filed Jul. 28, 1977, Ser. No. 819,746
Int. Cl.² H03B *5/36*
U.S. Cl. 331—116 R **4 Claims**

1. A voltage controlled oscillator in which an applied voltage establishes a related frequency of oscillation, said oscillator comprising:

a resonator for controlling the nominal frequency of said oscillator;

amplifying means coupled to said resonator for sustaining oscillation therein;

variable phase shift means coupled between said resonator and said amplifying means, said variable phase shift means being responsive to said applied voltage to vary said frequency; and



non-linear control means including an unbalanced differential amplifier stage coupled to said variable phase shift means whereby the relation between said applied voltage and said frequency is substantially linear.

4,132,965

BAND-PASS FILTER CONSTRUCTED FROM CONCENTRICALLY ARRANGED COAXIAL RESONATOR CAVITIES

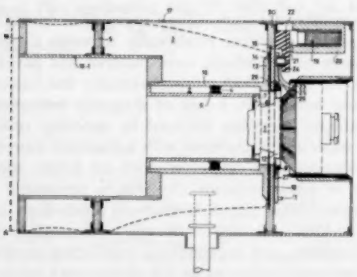
Jozef J. M. Warringa, and Harry Piepers, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 4, 1977, Ser. No. 793,882

Claims priority, application Netherlands, May 10, 1976, 7604950

Int. Cl.[2] H01P *1/20, 7/06*

U.S. Cl. 333—73 R **4 Claims**



1. A band-pass filter comprising a first cylindrical conductor, a second cylindrical conductor coaxial with and spaced from said first conductor to define a first resonator cavity therebetween, a third cylindrical conductor coaxial with and spaced from said first conductor to define a second resonator cavity therebetween, a pair of annular electrically conductive plates arranged in superposed relationship about one end portion of said first conductor and a dielectric member disposed between said annular plates to form with said plates a capacitor which mutually couples said first and second cavities and determines the bandwidth of the band-pass filter, said third conductor being detachably secured to said first conductor to permit replacement of said dielectric member with a different dielectric member to thereby change the capacitance of said capacitor and the bandwidth of the filter.

4,132,966

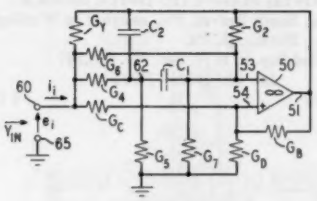
SINGLE AMPLIFIER FREQUENCY DEPENDENT NEGATIVE RESISTOR

Dan Hilberman, Menlo Park, Calif., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 18, 1977, Ser. No. 825,536

Int. Cl.[2] H03H *5/04*

U.S. Cl. 333—80 R **12 Claims**



1. A circuit including an input terminal and further comprising

an amplifier having first and second inputs and an output,

a conductance G_2 coupling the output to the first input,

a capacitance C_1 coupling the input terminal to the first input,

a conductance G_C coupling the input terminal to the second input,

conductances G_7 and G_D, respectively, coupling the first and second inputs to ground,

a capacitance C_2 directly coupling the output to the input terminal, and

a conductance G_Y directly connecting the output to the input terminal,

wherein an admittance Y_{IN} between the input terminal and ground equals Ds^2, where D is a real number and s is a complex frequency variable.

4,132,967

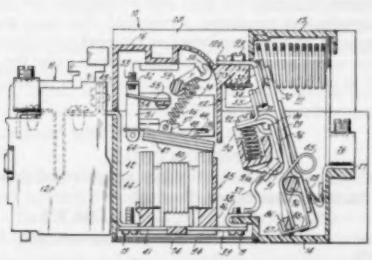
UNITIZED COMBINATION STARTER

Carl E. Gryctko, Bellefontaine, Ohio, assignor to I-T-E Imperial Corporation, Spring House, Pa.

Filed Apr. 29, 1976, Ser. No. 681,690

Int. Cl.[2] H01H *73/00*

U.S. Cl. 335—11 **5 Claims**



1. A switching device including a plurality of side-by-side pole units each having separable switch contact means, separable contactor contact means, conductor means connecting said contactor contact means in series circuit with said switch contact means; a unitized molded insulating base whereon both said switch and contactor contact means are mounted; a common insulating housing means including said base as an element thereof positioned at the rear of said housing means; said housing means also including cover means in front of said base and removably mounted thereto; said cover at the rear thereof including a plurality of ribs aligned and cooperating with a

plurality of ribs at the front of said base to form a plurality of side-by-side internal compartments, one for each of said pole units; both said switch and contactor contact means and said conductor means being disposed within said housing means, with an individual set of said switch contact means being disposed within an individual one of said compartments.

4,132,968

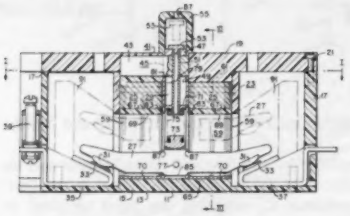
CURRENT LIMITING CIRCUIT BREAKER WITH IMPROVED MAGNETIC DRIVE DEVICE

Walter W. Lang, South Beaver, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 6, 1977, Ser. No. 830,947

Int. Cl.[2] H01H *77/10*

U.S. Cl. 335—16 **4 Claims**



1. A current limiting circuit interrupter, comprising:

a housing;

separable contacts supported within said housing;

a slotted magnetic drive device mounted within said housing and having a slot with an open end and a closed end; and

an elongated movable contact arm supporting one of said contacts and supplying current thereto, said contact arm being transversely disposed in said slot so that current flow through said contact arm is in a direction generally perpendicular to a line connecting said open and closed slot ends, said contact arm being movable between a first position at said slot open end which permits current flow through said contacts and a second position at said slot closed end which interrupts current flow through said contacts, overcurrent conditions through said contacts generating magnetic flux in said magnetic drive device across said slot open end to generate an electro-dynamic force driving said contact arm from said first position to said second position;

said magnetic drive device comprising a saturable magnetic member bridging the open end of said slot and shunting magnetic flux produced across said slot open end, said magnetic member saturating at a predetermined overcurrent value to raise to said predetermined value the threshold at which said electro-dynamic force is produced.

4,132,969

IGNITION COILS

Peter T. Hillyard, Solihull, England, assignor to Lucas Industries Limited, Birmingham, England

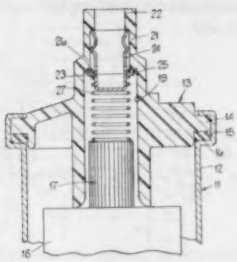
Filed May 20, 1977, Ser. No. 798,979

Claims priority, application United Kingdom, Jun. 8, 1976, 23585/76

Int. Cl.[2] H01F *27/04*

U.S. Cl. 336—94 **14 Claims**

1. An ignition coil including a hollow casing housing the core and the primary and secondary windings of the coil, the casing including, at one end, an electrically insulating cap supporting the high tension output terminal of the coil, said cap having extending therethrough a bore communicating with the interior of the casing, and the wall of the bore defining a radially extending shoulder presented inwardly of the casing, said high tension terminal being movable received in said bore, and being movable inwardly of the casing, from a first, rest position, wherein the terminal sealing engages said shoulder so sealing the casing, to a second position wherein there is established communication between the exterior and the interior of



the casing by way of said bore, and means for retaining said terminal in said first, rest position.

4,132,970

POTENTIOMETER

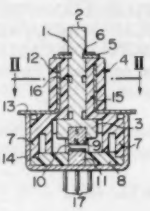
Noboru Masuda, and Shoichi Sugimoto, both of Tokyo, Japan, assignors to Denki Onkyo Company, Limited, Japan

Filed Aug. 8, 1977, Ser. No. 823,017

Claims priority, application Japan, Aug. 6, 1976, 51-105065[U]

Int. Cl.[2] H01L *43/02, 43/08*

U.S. Cl. 338—32 R **5 Claims**



1. A potentiometer comprising a rotary shaft having one end connectable to a system rotationally movable a cylindrical holder made of a synthetic resin material and partially surrounding the rotary shaft circumferentially and supporting it for angular movement, a pair of magnetic resistance effect semi-conductor elements disposed in opposing relationship with the other end of the shaft with a clearance therebetween a supporting member connected with the holder supporting said pair of semi-conductor elements, a permanent magnet carried by said other end of the shaft and producing a magnetic field which alternately acts on the pair of elements as the shaft moves angularly, and a cylindrical reinforcing member of a metallic material and having an axis aligned with the axis of the shaft, the reinforcing member being embedded within the holder, and the inner surface of the holder serving as a bearing surface for the shaft.

4,132,971

NONINDUCTIVE FILM-TYPE CYLINDRICAL RESISTOR AND METHOD OF MAKING IT

Richard E. Caddock, Jr., 5623 Bedford, Riverside, Calif. 92507

Filed Feb. 28, 1977, Ser. No. 772,654

Int. Cl.[2] H01C *3/02*

U.S. Cl. 338—61 **7 Claims**

1. A stable, cylindrical film-type resistor, which comprises:

(a) an elongated cylindrical substrate, and

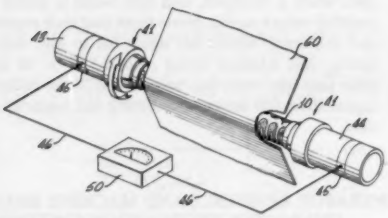
(b) an electrically resistive film silk-screened onto the exterior cylindrical surface of said substrate,

said film comprising an elongated serpentine strip of resistive material,

said film being absent from a substantial gap which extends along the full length of one side of said surface parallel to the axis of said substrate,

said strip comprising a multiplicity of hairpin-shaped portions the arms of which are substantially parallel to each other and extend circumferentially around at least half of said surface,

said hairpin-shaped portions having bends or bases which connect said arms and which are much wider than are the widths of said arms,



the widths of said bends or bases being measured circumferentially of said substrate, said widths of said arms being measured longitudinally of said substrate,

the widths of said bends or bases being at least twice that of said arms,

said film having been trimmed by effecting relative rotation between the resistor and a lapping means placed in abrading contact with the resistor and then relatively rotated about the axis of the resistor,

whereby the exterior surface of said film is lapped.

4,132,972

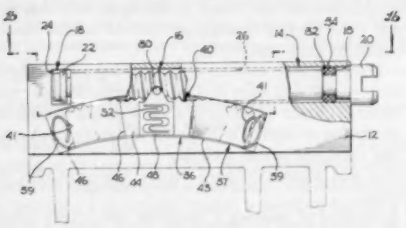
MINIATURE RECTANGULAR POTENTIOMETER WITH A SPRING COMPRESSION CLUTCH

Edward H. Tumbusch, Sepulveda, Calif., assignor to Techno-Components Corp., Van Nuys, Calif.

Continuation-in-part of Ser. No. 707,824, Jul. 22, 1976, abandoned. This application Aug. 17, 1977, Ser. No. 825,442

Int. Cl.[2] H01C *10/42*

U.S. Cl. 338—180 **7 Claims**



1. A potentiometer comprising:

a housing;

a resistance element disposed within said housing;

a conductive element disposed within said housing;

an elongated screw rotatably disposed within said housing;

a sector gear slideably disposed in said housing along an arcuate path and being adapted to engage said elongated screw;

a conductive wiper fixed to said sector gear and being in sliding contact with said resistance and conductive elements; and

a resilient spring disposed in said housing and engaging said sector gear at the extremes of travel of said sector gear.

4,132,973

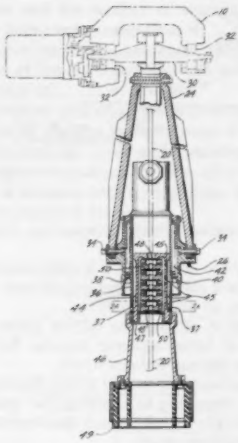
CABLE WIPER ASSEMBLY

Myrl E. Orme, Canoga Park, Calif., assignor to The Bendix Corporation, North Hollywood, Calif.

Filed Jan. 28, 1977, Ser. No. 763,376

Int. Cl.[2] B63B *21/16*

U.S. Cl. 340—3 T **8 Claims**



1. In a system for deploying and retrieving a transducer which is operated at substantial depths including a cable connected to said transponder, a hoist, at least one guide sheave on said hoist for directing said cable;

a cable wiper structure attached to said hoist and suspended therefrom in such manner that said cable is drawn through said structure, said structure including a plurality of flexible washer-like wiper members surrounding said cable,

a plurality of axially aligned spacers carried in said structure between said wiper members, said spacers being of significant thickness and each having a well below an adjacent wiper member and an essentially flat surface on its opposite side with a passageway through the center of said spacer only slightly larger than the diameter of said cable and a plurality of radial passageways extending through the sides of said spacers from said well to the outside walls of said spacers;

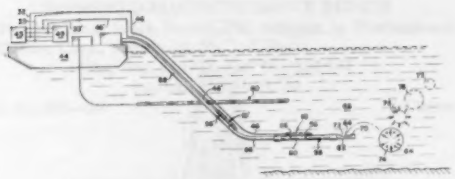
housing means forming part of said structure including a tubular member enclosing said wiper members and said spacers and which includes a plurality of ports in its sidewall,

a retainer member adjacent the lower side of the lower wiper member having a central opening somewhat larger than that of said wiper and means securing said retainer tightly against said lower wiper member and hence securing said spacer and wiper members in position against the opposite end of said tubular member, such that upon deployment of said cable said cable passes through said wipers with essentially no resistance since said wipers deflect into the wells of said spacers and upon retrieval of said cable, said cable draws said wipers against said flat surface of said spacers causing said wipers to maintain a snug contact against said wipers causing said wipers to strip away water adhering to the surface of said cable and causing at least part of said water to flow into said wells and from thence through said radial passageways and said ports in said housing means.

4,132,974
METHOD FOR SEISMIC MARINE SURVEY

John C. Mollere, Nassay Bay, Tex., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 354,269, Apr. 25, 1973, Pat. No. 4,059,819, and a continuation-in-part of Ser. No. 115,360, Feb. 16, 1971, abandoned. This application Jul. 11, 1977, Ser. No. 814,517
Int. Cl.[2] G01V 1/38
U.S. Cl. 340—7 R 2 Claims



1. A method of marine seismic prospecting comprising the steps of:

establishing a bubble containing a high-pressure expanding volume of gas at a sufficient depth to prevent the gas from directly venting to the atmosphere;

the initial expansion of said gas bubble generating in the water a desired initial acoustic impulse for subsequent reflection from the sub-bottom strata;

said gas bubble subsequent to said initial expansion collapsing and again expanding to create in the water at least a first bubble acoustic impulse which also becomes reflected from said sub-bottom strata;

detecting the reflected signals from said initial impulse and said first impulse; and

detecting the unreflected acoustic impulses with at least one pressure detector assembly, said detector assembly comprising:

(a) a housing having a flexible, pressure-transmitting wall defining a chamber;

(b) a substantially incompressible dielectric liquid completely filling said chamber,

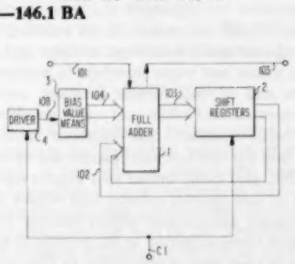
(c) a detector probe completely immersed in said liquid, said probe comprising: a metallic housing, a quartz crystal mounted on an inner wall portion of said housing, an amplifier in said housing, and circuit means coupling said quartz crystal to the input circuit of said amplifier; and

recording at a remote location the output signals from said amplifier, said output signals representing said unreflected acoustic impulses.

4,132,975
MAJORITY DECISION DEVICE

Nobuhiko Koike, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Oct. 25, 1977, Ser. No. 845,083
Claims priority, application Japan, Oct. 27, 1976, 51-129902
Int. Cl.[2] G06F 11/08
U.S. Cl. 340—146.1 BA 2 Claims



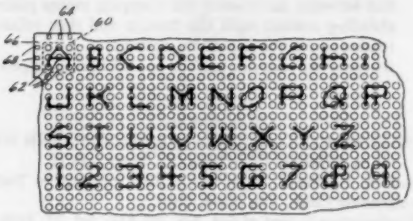
1. A majority decision device in a system of the type wherein a data word of M bits is serially and repeatedly received a given number of times N, comprising:

a plurality of parallel shift registers, each having a bit length equal in number to the length of said received data word, said plurality being the smallest integer equal to or exceeding $\log_2 N$; a full adder having parallel output signals from said shift registers applied thereto as first addition input signals; means for setting a predetermined bias value at second parallel addition input terminals of said full adder, means for serially applying said received data words as a carry input signal to said full adder, the parallel sum output signals obtained from said full adder being connected to said plurality of shift registers, wherein each time said data word is received, said data word is added with the parallel output signals given from said shift register group and the result signals are again fed to said shift register group, said addition being repeated $N \times M$ times, and after said bias value has been added to the adder, a carry signal from full adder constituting the majority decision-data.

4,132,976
OPERATOR READABLE AND MACHINE READABLE CHARACTER RECOGNITION SYSTEMS

Richard G. Siegal, 6201 N. Kenmore, Apt. 202, Chicago, Ill. 60660

Filed Sep. 8, 1975, Ser. No. 610,928
Int. Cl.[2] G06K 9/18
U.S. Cl. 340—146.3 Z 12 Claims



1. A method of entering data into a data processing system, comprising the steps of:

providing a sheet having an area designated with a plurality of spaced apart, open circles arranged in three rows and three columns,

placing a handwritten mark in the form of a character on said sheet passing through any part of at least one of said circles to mark said circle,

providing a data processing system having a scanning device for scanning said sheet and for producing signals representative of circles which have a mark placed therein and for producing no signals in response to handwritten marks on said sheet not within a circle,

whereby said signals define a binary representation of said character,

4. A method of entering a character into a data processing system comprising the steps of:

providing a push button telephone having at least nine push buttons arranged in three rows and three columns,

operating two or more of said nine push buttons successively within a predetermined interval,

providing data processing apparatus having decoding apparatus for receiving and decoding signals produced by said push button telephone and for manifesting signals representative of an alphanumeric character, said operated ones of said push buttons bearing a physical relationship to each other within said three rows and three columns which corresponds to the apparent shape of said character,

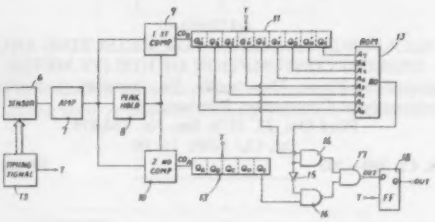
and operating an additional push button to signify the end of a said predetermined interval.

4,132,977

IMAGE INFORMATION READING APPARATUS

Humikazu Nagano, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 21, 1977, Ser. No. 817,620
Claims priority, application Japan, Jul. 23, 1976, 51-88570
Int. Cl.[2] G06K *9/00*
U.S. Cl. 340—146.3 AG **9 Claims**



1. An image information reading apparatus, comprising means for reading an optical image,

a peak hold means, connected to the output of said means for reading an optical image, for storing the peak analog value of the output of said receiving means for a predetermined period of time,

first and second means responsive to peak hold means for level detecting and converting into a succession of digital outputs the output from said peak hold means at first and second predetermined levels, respectively, that are different from each other,

means coupled to said second level detecting and converting means for determining the pattern of successive digital outputs obtained by said second level detecting and converting means for providing a selection signal, and

gate means coupled to said first and second level detecting and converting means and responsive to said selection signal for selectively transmitting the output of either of said first and second level detecting and converting means.

4,132,978

SYSTEMS FOR RECOGNIZING PRINTED CHARACTERS

Denis L. Mercier, St Georges, Loire, France, assignor to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull, Paris, France

Filed Jul. 13, 1977, Ser. No. 815,280
Claims priority, application France, Jul. 15, 1976, 76 21670
Int. Cl.[2] G06K *9/00*
U.S. Cl. 340—146.3 ED **11 Claims**

1. A method of operating a data process system for recognizing characters disposed upon a document, the data processing system including a document reader, a memory having a plurality of N memory zones, each memory zone having up to a maximum of m addressable locations and a buffer store, said method comprising the steps of:

(a) conducting a first reading of the document by operating the document reader to read a set of characters to obtain information data, as the document is moved with respect to the document reader;

(b) checking the information data derived from the document reader and providing associated error codes with respect to this information data;

(c) storing in a first memory zone of the N zones the information data obtained during the first reading of the document and the associated error codes resulting from checking this information data;

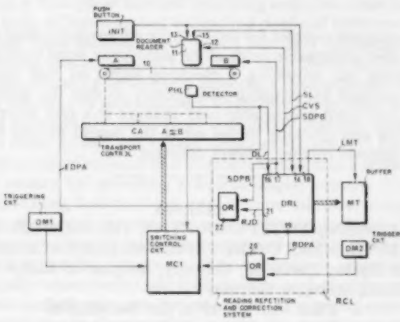
(d) checking the error codes stored in the first zone to determine whether at least one character of the characters read during the first reading, is erroneous;

(e) conducting repeated readings of the set of characters under different respective conditions, and storing the new information data and associated error codes resulting from each of the repeated readings in corresponding, different memory zones of the memory for as long as at least one erroneous character is detected in the course of a reading operation, each of the number of repeated readings of the document and the number of storage operations in the memory being not greater than N;

(f) initiating a correcting sequence when the Nth reading operation of the document has been performed, including the substeps of:

1— reading out data information from the first addressable location of the first memory zone of the memory;

2— examining the error code associated with the data information read from the first addressable location of the first memory zone to determine whether the associated character is erroneous;



3— repeating the reading out of the associated error code from the same address in the next successive zone of the memory if an error is detected by reviewing the associated error code, and for repeating the reading from the next address in the same zone if an examination of the associated error code indicates that an error has not been detected;

4— terminating the reading out of data information from the memory at the Mth address of a memory zone other than the Nth zone, and at the Mth address of the N zone, respectively, if no error is detected in the information data read from the latter address, and transferring the data information read out from the memory, if a checking of the error code indicates no error to the buffer store; and

(g) rejecting the document and the items of information transferred to the buffer store if the data information as obtained from the Mth address of one of the memory zones is erroneous.

4,132,979

METHOD AND APPARATUS FOR CONTROLLING A PROGRAMMABLE LOGIC ARRAY

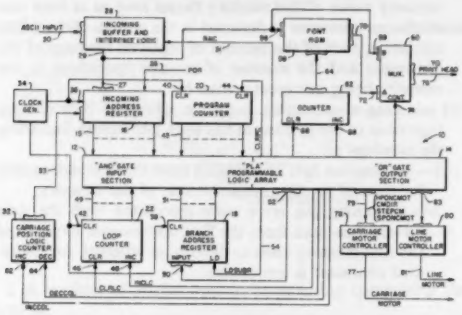
Richard H. Heeren, Palatine, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Dec. 15, 1976, Ser. No. 750,934
Int. Cl.[2] H04L *15/34;* **H04Q** *3/47;* **G06F** *5/04;* **G05B** *15/02*
U.S. Cl. 340—147 P **13 Claims**

1. A control circuit for a programmable logic array with an input logic section having a plurality of addressable fields and an output logic section in cascade with the input section and providing a plurality of signal outputs, an improved circuit for addressing the fields of the input section of the logic array comprising:

means for addressing a first one of the addressable input fields in accordance with an incoming data signal,

a branch address register addressing a second one of said addressable input section fields as determined by selected outputs of the output section of the logic array provided in response to a preceding input section address;



a program counter for sequentially addressing a third one of said addressable fields of the logic array input section, and

means for providing a clocking signal to said program counter for stepping said counter so that the address of said third addressable field changes at a rate determined by said clocking means while the output of said branch address register remains constant.

4,132,980

HIGH-SENSITIVITY INDUCTIVE TRANSDUCER FOR RECTILINEAR OR ROTATIONAL DISPLACEMENT

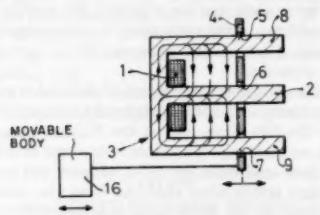
Erich Zabler, Karlsruhe, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Mar. 30, 1976, Ser. No. 671,993

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1975, 2515257

Int. Cl.[2] G08C *19/06*

U.S. Cl. 340—195 **4 Claims**



1. An inductive transducer for converting a mechanical movement into an electrical signal having a predetermined dependence on the movement of a body, comprising:

a ferromagnetic core having at least three elongated portions elongated in the same direction and separated from each other by air gaps that are likewise elongated in the same direction as said elongated core portions, one of said elongated portions being centrally located among said elongated core portions, and a yoke portion joining said elongated portions;

a short-circuiting member of conducting material encircling only that one of said elongated portions of said core which is centrally located among said elongated core portions and passing through the air gaps between said centrally located elongated portion and the other elongated core portions, said short-circuiting ring member being movable with respect thereto in the same direction of elongation of said core, and being thin with respect to its physical dimension in the direction of elongation of said core portions, said short-circuiting ring member being mechanically connected with a movable body that is movable in a direction corresponding to the mobility of said short-circuiting member with respect to said core, and

a magnetic winding adjacent said yoke portion of said core and encircling said centrally located elongated portion of said core in such a manner as to couple with magnetic flux passing through said yoke portion of said core,

whereby the inductance of said magnet winding is variable in accordance with a predetermined relation to the displacement of said body.

4,132,981

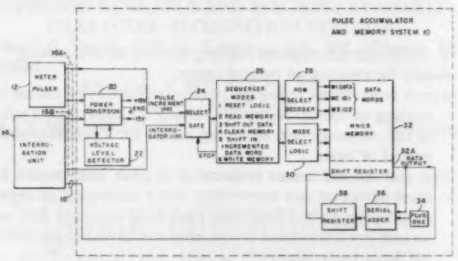
SELF-POWERED SYSTEM FOR MEASURING AND STORING CONSUMPTION OF UTILITY METER

Raymond V. White, Monroeville, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Oct. 21, 1976, Ser. No. 734,678

Int. Cl.[2] G08C *19/16*

U.S. Cl. 340—203 **39 Claims**



1. In a system without a local power supply for measuring and accumulating a manifestation of the consumption of a utility, comprising:

(a) meter means responsive to the utility consumption for generating a series of pulse-like, electrical signals, each indicative of the consumption of a given quantity of the utility;

(b) non-volatile memory means for storing an indication of the number of the pulse-like, electrical signals generated by said meter means, indicative of the total measured utility consumed;

(c) power conversion means for converting at least one of the pulse-like, electrical signals to provide solely that voltage for energizing said system, including detector means responsive to the initiation of a pulse-like, electrical signal for providing an initiate operate signal; and

(d) sequence control means responsive to the initiate operate signal for enabling the received pulse-like signal to be stored in said memory means, and thereafter providing a terminate operation signal effecting the deactuation of said system.

4,132,982

GASEOUS DISPLAY DEVICE

Bernard W. Byrum, Toledo; Roger E. Ernsthausen, Luckey, and Michael E. Fein, Toledo, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

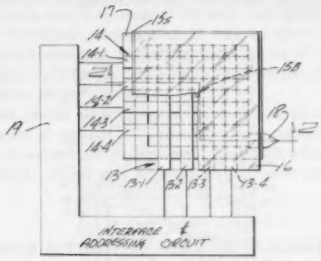
Continuation-in-part of Ser. No. 293,555, Sep. 29, 1972, which is a division of Ser. No. 210,093, Dec. 20, 1971. This application Nov. 10, 1975, Ser. No. 630,585

Int. Cl.[2] G06F *3/14*

U.S. Cl. 313—188 **22 Claims**

1. In a gas discharge device containing at least two electrodes, at least one of the electrodes being insulated from the

gas by a dielectric member, the improvement wherein the gas-contacting surface of at least one dielectric member contains an insulating inorganic nickel compound, said compound containing no oxygen atoms directly bonded to a nickel atom.



4,132,983

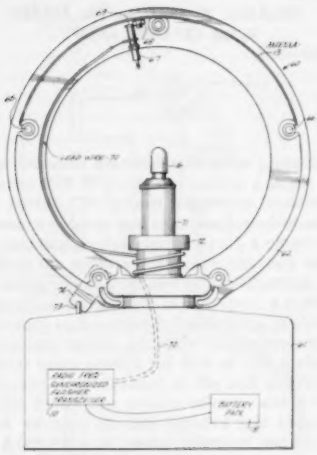
RADIO SYNCHRONIZED WARNING LIGHT SYSTEM

Haskell Shapiro, Corona Del Mar, Calif., assignor to Royal Industries, Inc., Pasadena, Calif.

Continuation of Ser. No. 648,180, Jan. 12, 1976, abandoned. This application Aug. 12, 1977, Ser. No. 824,074

Int. Cl.[2] E01F *9/00*; G08B *5/38*; H05B *39/09*

U.S. Cl. 340—331 **14 Claims**



6. A radiant energy synchronized warning light flasher transceiver comprising

radiant energy transmitting means, radiant energy receiving means,

resettable timing means for controlling the time intervals that the transmitting means transmits a signal in response to a resetting timing signal,

battery means for powering the transceiver,

circuit means for conditioning the timing means to be reset in response to a signal received at the receiving means at a time just prior to the resetting time of the timing means to produce a resetting timing signal in response thereto, and

means for controlling the transmitting time intervals of the transmitting means to a preselected portion of the light flashing time.

4,132,984

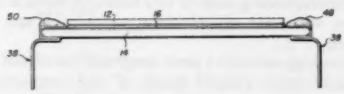
LIQUID CRYSTAL DISPLAY

Gerald G. Gross, Solon, Ohio, assignor to Liquid Xtal Displays Inc., Cleveland, Ohio

Filed May 20, 1976, Ser. No. 688,399

Int. Cl.[2] G09F *9/32*

U.S. Cl. 350—336 **2 Claims**



1. A liquid crystal display device comprising a back plane member, a front plane member overlying said back plane member, a body of liquid crystal compound confined between said front and back members, one of said members including first and second spaced marginal portions respectively projecting laterally outwardly in different directions from adjacent margins of the other of said members, a plurality of electrode strips of thin substantially transparent conducting material such as indium oxide on said one of said members respectively including first portions between said members arranged in a predetermined pattern for providing a desired display, certain of said strips including lead portions extending on said first marginal portion of said one member, other of said strips including lead portions extending on said second marginal portion of said one member, a plurality of separate contact elements respectively electrically connected to said lead portions each of said contact elements including an attachment portion comprising opposed legs mechanically firmly gripping said one member therebetween with one of said legs in electrical contact with a lead portion, the mechanical gripping of said legs providing substantially the only means maintaining said electrical contact, and bodies of adhesive coating material over said first and second marginal portions and permanently securing each of said contact elements with respect to said one member, each of said contact elements including a portion projecting from said one member for electrical connection with complemenatry circuit means.

4,132,985

AUTOMATIC CONTROL DEVICE FOR CAMERAS

Mashio Kitaura, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 385,279, Aug. 3, 1973, Pat. No. 3,988,069. This application Jan. 26, 1976, Ser. No. 652,548

Int. Cl.[2] H03K *13/03*

U.S. Cl. 340—347 AD **5 Claims**

1. A digital indicator apparatus for a camera for providing a digital indication of intensity of scene brightness comprising:

(a) means responsive to the intensity of scene brightness for producing a first analog signal representative thereof;

(b) generator means for providing a train of clock pulses;

(c) counter means for counting said clock pulses to provide successive digital count outputs, said counter means having a first mode responsive to an additive control signal to additively count said clock pulses and a second mode responsive to a subtractive control signal to subtractively count said clock pulses;

(d) conversion means for converting said successive digital count outputs into a second analog signal of respectively corresponding values;

(e) means for comparing said second analog signal with said first analog signal to produce said additive control signal

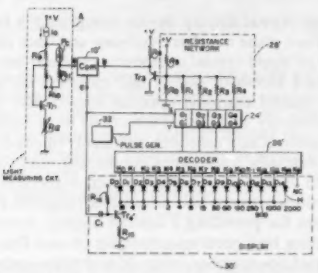
for supply to said counter means when a first predetermined relationship exists between said first and second analog signals, and to produce said subtractive control signal for supply to said counter means when a second predetermined relationship opposite to said first relationship exists between said first and second analog signals;

(f) indicating means having a plurality of indicator devices selectively energizable to indicate respectively corresponding digital count outputs of said counter means;

(g) decoder means for selectively and sequentially energizing corresponding ones of said indicator devices in accordance with said digital count outputs of said counter means;

(h) means responsive to a predetermined one of said additive and subtractive control signals of said comparing means for interrupting the energization of said indicator devices;

whereby only one of said indicator devices indicative of said first analog signal is energized to provide a digital indication of intensity of scene brightness;



further comprising a current supply path for energization of said indicator devices, and wherein said interrupting means comprises switching means connected in said current supply path, said switching means normally allowing a supply of current to said indicator devices therethrough and being responsive to said predetermined one of the additive and subtractive control signals; and

wherein said switching means comprises a capacitor and a transistor having an emitter, a collector and a base, said transistor being connected with said emitter-collector conducting path in said current supply path and normally being maintained conductive, and said capacitor being connected to said base for applying said additive and subtractive control signals to said base, said predetermined one of the additive and subtractive control signals having a voltage level for rendering said transistor nonconductive.

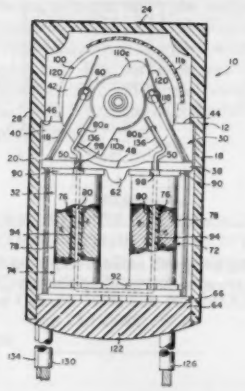
4,132,986

ELECTROMAGNETIC INDICATOR

Robert D. Hart, Collinsville, and Robert Mazzamauro, Waterbury, both of Conn., assignors to General Time Corporation, Thomaston, Conn.

Filed Aug. 9, 1977, Ser. No. 823,169
Int. Cl.[2] G08B 5/22
U.S. Cl. 340—373 **5 Claims**

1. An apparatus comprising an indicator having capability sequentially of visual indication of one of a plurality of two states, in each of two dispostions, switch means adapted to be connected in an electrical circuit and including at least one switch which is closed when said indicator is in one disposition and open when said indicator is in the other disposition, means mounting said indicator for movement from said one to said other disposition and in return to the first disposition, means imparting movement to said mounting means, and wherein the improvement is characterized by said switch means comprising a pair of contact members, and means supporting said contact members both in cantilever fashion and in close association with said mounting means, said supporting means including means for fixedly locating one of said contact members relative to the other contact member which normally is biased into contact therewith whereby said mounting means upon move-



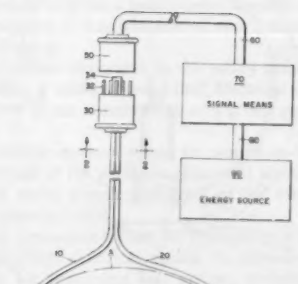
ment additionally functions as a switch actuator to open said switch means when said indicator moves toward and into said other disposition and to allow said switch to close when said indicator returns toward said one dispostion.

4,132,987

SECURITY SYSTEM

Richard A. Devereaux, 112 Wolcott Ave., West Springfield, Mass. 01089

Filed Oct. 26, 1977, Ser. No. 845,635
Int. Cl.[2] G08B 13/00
U.S. Cl. 340—506 **3 Claims**



2. An alarm system for preventing theft of a protected area or equipment, said system including an electrically continuous closed looped circuit having input terminals through a conductor plug through which the looped circuit is energized, the looped circuit comprising :

(a) a pair of serially-connected legs consisting of

(b) a first conductor including one insulated elongated core member of positively charged conducting material and an insulated elongated shield member of negatively charged conducting material, each of the core and shield members being electrically connected at one of their respective ends to a respective one of the conductors of the plug,

(c) a second conductor including an insulated elongated core member of negatively charged conducting material and an insulated elongated shield member of positively charged conducting material, each of the core and shield members being electrically connected at one of their respective ends to a respective one of the conductors of the plug,

(d) a female phone jack connector connected to the first conductor at its free end,

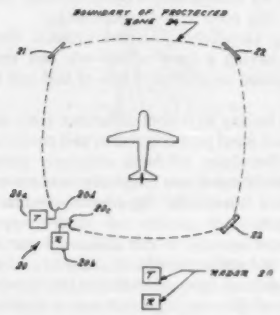
(e) a male phone jack connector connected to the second conductor at its free end, whereby the conductors of the first and second conductors are transposed when the male and female phone jack connectors are interconnected.

4,132,988

RADAR INTRUSION DETECTION SYSTEM

Philipp Blacksmith, Concord; J. Leon Poirier, Chelmsford, and Frederick S. Holt, Winchester, all of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 19, 1977, Ser. No. 826,082
Int. Cl.[2] G08B *13/18*
U.S. Cl. 340—552 **1 Claim**



1. A radar intrusion detection system for protection of isolated resources such as planes comprising a single active bistatic radar having a co-located transmitter, associated transmitter antenna, a receiver and associated receiver antenna, an attenuator receiving the transmitter signal, a phase shifter fed the signal from the receiver antenna, a summary tee simultaneously receiving signals from said phase shifter and said attenuator, the resultant being fed to said receiver, a multiplicity of passive reflectors, each passive reflector being positioned in an associated separate corner, said radar transmitter antenna projecting a radar beam toward the first of said multiplicity of passive reflectors for redirection to the next passive reflector for redirection to the next passive reflector and ultimately to said receiver antenna, the line between said transmitter antenna, said multiplicity of passive reflectors and said receiver antenna surrounding the isolated resources to be protected establishing a boundary and safe zone therein whereupon intrusion across said boundary an alteration of the radar beam occurs manifested as a change in signal level, and an alarm connected to said receiver, said alarm being triggered upon intrusion across said boundary.

4,132,989

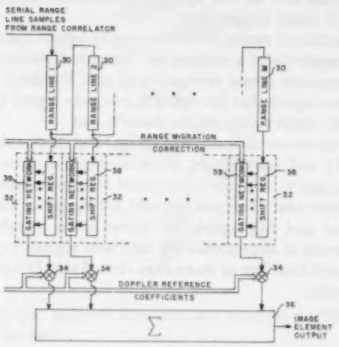
AZIMUTH CORRELATOR FOR REAL-TIME SYNTHETIC APERTURE RADAR IMAGE PROCESSING

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Wayne E. Arens, Pasadena, Calif.

Filed Oct. 18, 1977, Ser. No. 843,308
Int. Cl.[2] G01S *7/30*
U.S. Cl. 343—5 CM **11 Claims**

8. In a synthetic aperture radar system, an azimuth correlator for real time image processing of range correlated range line samples from echo return signals, the combination comprising:

a plurality of serial range-line buffer memories cascaded so that the output stage of one feeds into the input stage of another, and the output stages of all buffer memories together form a complete and unique range bin, whereby a range bin is automatically read out on a range line sample-by-sample basis,



correlation means connected by coupling means to receive outputs from said range-line buffer memories for correlating a controllably variable Doppler reference function with each successive range bin to form an image element on a real time basis, and

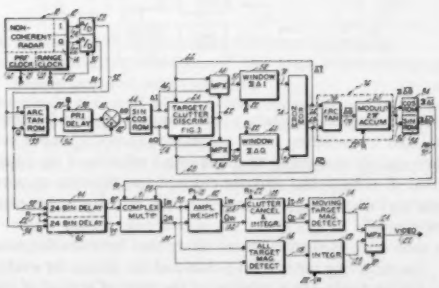
means for summing the Doppler reference correlated range bin samples.

4,132,990

AMTI TARGET/CLUTTER DISCRIMINATOR

John A. Di Domizio, Norwalk; George T. Briechle, Monroe, and Douglas Ell, West Hartford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 12, 1977, Ser. No. 841,504
Int. Cl.[2] G01S *9/42*
U.S. Cl. 343—7 A **2 Claims**



1. In an AMTI processing apparatus of the type which processes return signals so as to provide ΔI and ΔQ signals which indicate the cosine and sine of the difference between the phase of the return signal in a given range bin during one PRI from the phase of the return signal of a corresponding range bin in a preceding PRI, and which includes averaging means which provides ΔI and ΔQ signals indicative of the average of the ΔI and ΔQ signals over some number of range bins in the range vicinity of the given range bin, clutter discrimination apparatus comprising:

first means responsive to said ΔI and said ΔI signals for providing a first absolute value signal indicative of the

absolute value of the difference between the magnitudes of said ΔI and ΔI signals;

second means responsive to said ΔQ and ΔQ signals for providing a second absolute value signal indicative of the absolute value of the difference between the magnitudes of said ΔQ and ΔQ signals;

summation means responsive to the outputs of said first and second means for providing sum signals indicative of the summation of the absolute values of the differences between said ΔI and ΔI signal magnitudes and said ΔQ and ΔQ signal magnitudes;

discriminant means for presenting D signals indicative of the magnitude of a rectangular distance discriminant;

comparison means responsive to said D signals and to said sum signals for providing a compare signal indicative of the relative magnitudes thereof; and

switch means responsive to said ΔI and ΔI signals and to said ΔQ and ΔQ signals, respectively, and operative in response to said compare signal for alternatively selecting either said ΔI signals and said ΔQ signals or said ΔI signals and said ΔQ signals for presentation to said averaging means in dependence on said sum signals representing a value less than or more than that of said D signals, respectively.

4,132,991

METHOD AND APPARATUS UTILIZING TIME-EXPANDED PULSE SEQUENCES FOR DISTANCE MEASUREMENT IN A RADAR

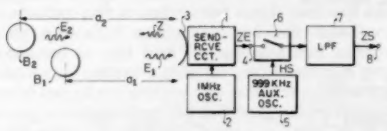
Berthold Wocher, Leonberg; Thomas Pfendler, and Heinz Pfitzemaier, both of Gerlingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 5, 1976, Ser. No. 729,663

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1975, 2544842

Int. Cl.² G01S 9/06

U.S. Cl. 343—13 R **8 Claims**



5. In a pulse radar system which comprises means for generating and transmitting radar pulses, for receiving radar echo pulses and for evaluating or displaying a relation of the time of arrival of echo pulses and the time of transmission of corresponding radar pulses, the improvement which consists of the provision of:

a time scale expansion circuit interposed between the means for receiving radar echo pulses and the means for evaluating or displaying a relation of the time of arrival of echo pulses and the time of transmission of corresponding radar pulses, which time scale expansion circuit comprises oscillator means for generating an auxiliary pulse sequence having a pulse repetition rate differing slightly from that of said transmitted radar pulses, a multiplier circuit having one input connected to the output of the radar pulse receiver and another input connected to the output of said auxiliary pulse sequence oscillator means, an integrator having its input connected to the output of said multiplier circuit and having an output supplying a sequence of radar echo pulses of expanded time scale.

4,132,992

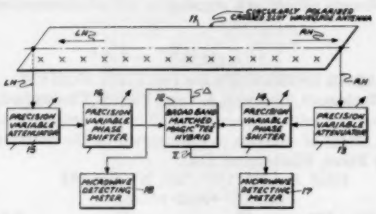
RADIATOR/CIRCUIT INCORPORATING A CROSS SLOT WAVEGUIDE ANTENNA ARRAY WHICH WILL INSTANTANEOUSLY MEASURE THE RADIATION AXIAL RATIO OR DEGREE OF LINEAR POLARIZATION OF ANY ANTENNA

Emmanuel J. Perrotti, Ramsey, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Sep. 19, 1977, Ser. No. 834,093

Int. Cl.² C01R 29/08

U.S. Cl. 343—100 PE **11 Claims**



1. A circuit for measuring the radiation axial ratio (R) of any antenna with any polarization comprising:

a receiving circularly polarized crossed slot waveguide antenna having a longitudinal axis and spaced crossed slots disposed on a selected side of said axis spaced therefrom

first means having an output difference port, an output sum port, a first input port coupled to said receiving antenna to receive therefrom left-hand circularly polarized waves and a second input port coupled to said receiving antenna to receive therefrom right-hand circularly polarized waves; and

second means coupled to said difference port to detect the value of the difference (Δ) of said waves coupled to said first and second input ports and to said sum port to detect the value of the sum (Σ) of said waves coupled to said first and second input ports to enable solving the equation $R = 20 \log \Sigma/\Delta$ to obtain the value of said radiation axial ratio.

4,132,993

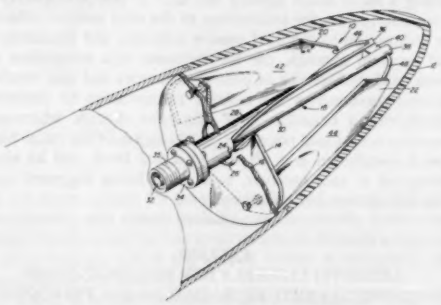
ANTENNA ELEMENT

John R. Ehrhardt, Carpinteria, and George J. Monser, Goleta, both of Calif., assignors to Raytheon Company, Lexington, Mass.

Filed Nov. 19, 1975, Ser. No. 633,533

Int. Cl.² H01Q 1/28

U.S. Cl. 343—705 **3 Claims**



1. An antenna element comprising:

(a) a ground plane;

(b) a pair of end fed radiating elements, each one having a first and second end, the first end of each one of the pair of radiating elements being fastened to the ground plane

and the radiating elements having planar surfaces, such surfaces being disposed in intersecting planes; and

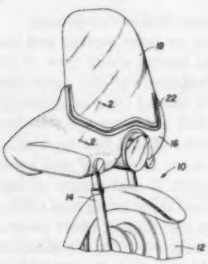
(c) a feed line having a pair of terminals, each one feeding the second end of a different one of the pair of radiating elements, such feed line including an outer conductor and an inner conductor, the outer conductor being fastened to the ground plane, and wherein the second ends of the pair of radiating elements are coupled through a continuous transistion to a different one of the pair of conductors.

4,132,994

RADIO ANTENNA FOR MOTORCYCLE

Winston A. Caldwell, Kte. 2, Box 375, Sulphur, La. 70663

Filed Nov. 25, 1977, Ser. No. 854,769
Int. Cl.[2] H01Q *1/32*
U.S. Cl. 343—713 **7 Claims**



1. A radio antenna structure for use on a motorcycle having a transparent non-conducting windshield and a non-conducting fairing supported on the vehicle, the antenna structure comprising, in combination,

an elongated metal antenna member shaped to closely conform to the contour of the edge portion of the windshield around at least a substantial portion of its periphery,

mounting means supporting said metal antenna member in fixed position extending adjacent said substantial portion of said edge of said windshield,

a plurality of elongated metal fasteners extending through said windshield and said fairing and mounting said windshield on a forwardly-directed surface of the fairing,

means establishing an electrical connection between said antenna member and at least one of said elongated metal fasteners forward of said windshield, and

flexible conductor means connected to said at least one fastener means rearwardly of said fairing for conducting signals from the antenna member to radio equipment on the motorcycle.

4,132,995

CAVITY BACKED SLOT ANTENNA

George J. Monser, Goleta, Calif., assignor to Raytheon Company, Lexington, Mass.

Filed Oct. 31, 1977, Ser. No. 846,740
Int. Cl.[2] H01Q *1/28, 13/18*
U.S. Cl. 343—767 **8 Claims**

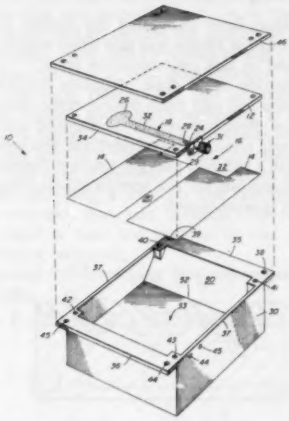
1. A radio frequency antenna, comprising:

(a) a dielectric support structure;

(b) a conductive sheet having a flared, discontinuous slot formed therein, such slot being disposed on one surface of the support structure;

(c) a feed for coupling radio frequency energy across a narrow portion of the flared slot; and

(d) a housing having: a cavity with conductive walls formed therein, the dielectric support structure being mounted to the housing to provide a cover for such cavity; and a deflection plate forming a wall of such cavity, such deflection plate being disposed at an acute angle with respect to



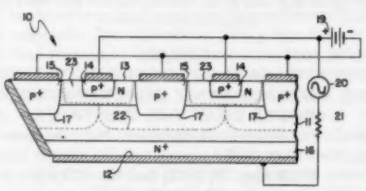
the dielectric support structure and beneath a wide portion of the slot.

4,132,996

ELECTRIC FIELD-CONTROLLED SEMICONDUCTOR DEVICE

B. Jayant Baliga, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 8, 1976, Ser. No. 740,027
Int. Cl.[2] H01L *29/74*
U.S. Cl. 357—21 **18 Claims**



1. An electric field-controlled thyristor comprising:

a semiconductor substrate of one type conductivity and having opposed major surfaces;

a cathode region of said one type conductivity in one of said major surfaces and of higher conductivity than the adjoining portion of said substrate;

a plurality of interconnecting grid regions of opposite type conductivity in the other major surface; and

an anode region of opposite type conductivity in said other major surface and within the interstices of adjacent grid regions.

4,132,997

MOS TYPE FIELD EFFECT TRANSISTOR

Hiroo Masuda, Kokubunji; Masaharu Kubo, Hachioji, and Ryoichi Hori, Tokyo, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 31, 1977, Ser. No. 764,428
Claims priority, application Japan, Jan. 30, 1976, 51-8476
Int. Cl.[2] H01L *29/78*
U.S. Cl. 357—23 **5 Claims**

1. A MOS type field effect transistor comprising:

a semiconductor substrate of a first conductivity type;

a source region and a drain region of a second conductivity

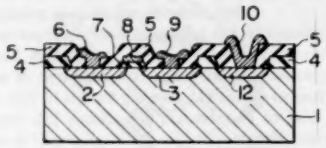
type, which is opposite to said first conductivity type, disposed in a surface portion of said semiconductor substrate;

a gate insulation layer convering the surface portion between said source region and said drain region;

a gate disposed on said gate insulation layer;

a source electrode and a drain electrode disposed on said source region and said drain region, respectively;

a rear surface electrode which is disposed on the other surface of said semiconductor substrate, and whose potential is held at a value so that the junction formed between said source and said surface portion of said semiconductor substrate is reverse-biased;



a base electrode which is disposed adjacent to, but not in contact with, said drain region at the other side of said source region with respect to said drain region and electrically connected with the surface portion of said semiconductor substrate, and whose potential is held at a value between that of the source and that of said rear surface electrode including the latter, the resistance between the surface portion covered by said gate oxide layer and said base electrode being smaller than the resistance between the surface portion covered by said gate insulation layer and the rear surface of said semiconductor substrate; and

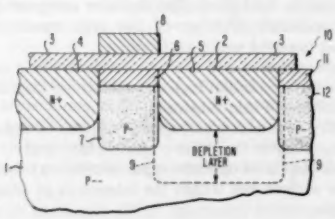
an insulating layer covering said surface portion of said semiconductor substrate except for said source electrode, said gate, and said drain electrode, and said base electrode.

4,132,998

INSULATED GATE FIELD EFFECT TRANSISTOR HAVING A DEEP CHANNEL PORTION MORE HIGHLY DOPED THAN THE SUBSTRATE

Andrew G. F. Dingwall, Bridgewater, N.J., assignor to RCA Corp., New York, N.Y.

Filed Aug. 29, 1977, Ser. No. 828,849
Int. Cl.² H01L 29/78
U.S. Cl. 357—23 **8 Claims**



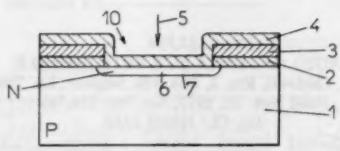
1. In a very low conductivity semiconductor bulk of one type conductivity, the combination of at least two spaced terminal electrode regions of the opposite conductivity type communicating with a defined surface of the bulk, a narrow channel portion, comprising an ion-implantation, extending between the two terminal regions, and a region also extending completely between the two terminal regions, said region being located more remote from the defined surface than the channel portion and having the same conductivity as, but to a substantially greater degree than, the substrate, said region extending to a greater depth from the surface than at least one of said terminal electrode regions, but said region not extending under either of said two spaced terminal electrode regions.

4,132,999

SEMICONDUCTOR DEVICES

Jacques H. P. Maillé, Paris, and André Salaville, Egly, both of France, assignors to Societe Anonyme de Telecommunications, Paris, France

Filed Dec. 1, 1976, Ser. No. 746,489
Claims priority, application France, Dec. 23, 1975, 75 39500
Int. Cl.² H01L 27/14
U.S. Cl. 357—30 **12 Claims**



1. A semiconductor device comprising:

a substrate having an outer surface and made of a semiconductor material having a first type of conductivity;

a region in said substrate at said outer surface of said substrate having a second type of conductivity, said region being doped with a doping agent to form a PN junction with said material of said first type of conductivity; and

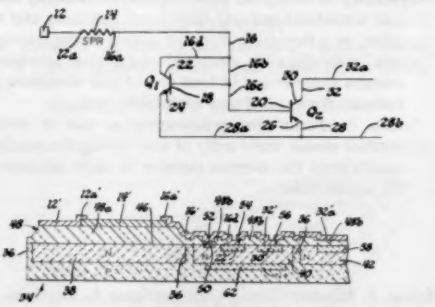
a layer on said outer surface of said substrate covering at least a major part of said region of said second type of conductivity, said layer being made of a material having a permeability to said doping agent under normal operating and storage conditions of the semiconductor device which is significantly lower than its permeability to said doping agent under the operating conditions of at least one method of diffusing said doping agent onto said substrate, said layer at least principally consisting of cadmium telluride.

4,133,000

INTEGRATED CIRCUIT PROCESS COMPATIBLE SURGE PROTECTION RESISTOR

Eugene Greenstein, Southfield, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 13, 1976, Ser. No. 750,268
Int. Cl.² H01L 27/02, 29/04
U.S. Cl. 357—46 **4 Claims**



1. A unitary semiconductor integrated circuit self-protected as to voltage surge comprising a body of semiconducting material, means defining a semiconductor junction having silicon dioxide insulation layer thereover with at least one overlaid conductor connected thereto at one part of said body, wherein a voltage surge directly applied to said conductor can deleteriously affect at least one of the conductor, the silicon dioxide layer and the semiconductor body, said body having a thermally grown silicon dioxide layer contiguous and integral with said first-mentioned silicon dioxide layer at said one part and of substantially greater thickness than any portion of said first-mentioned silicon dioxide layer, means defining a resistance layer that is wholly over said last-mentioned silicon dioxide layer and connected at one end to said conductor, the

other end of said resistance layer being adapted for connection to a circuit apparatus subject to voltage surges, the resistance value of said resistance layer between its ends being so related to the conductivity of the junction that a voltage drop across the resistance layer absorbs the voltage surges.

4,133,001

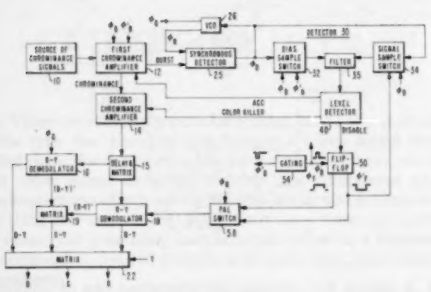
Patent Not Issued For This Number

4,133,002

PAL IDENTIFICATION CIRCUIT

Willem H. Groeneweg, Ottenbach, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Sep. 26, 1977, Ser. No. 836,420
Int. Cl.[2] H04N 9/47
U.S. Cl. 358—18 **10 Claims**



1. In a receiver for processing a color television signal including chrominance and burst components exhibiting a prescribed mutual timing relationship and alternating in phase on a line by line basis, a chrominance channel for processing said color signal, a plurality of color demodulators for demodulating selected phases of said chrominance component, means for providing line by line switching control of one of said demodulators, and wherein proper operation of said receiver requires that said demodulator be switched in correct timing synchronism with line by line alternation of signals received by said receiver, switching control apparatus comprising:

timing means for providing half line frequency timing signals, said timing means being coupled to said switching control means for determining said line by line switching;

means for providing keying signals coincident with said burst component;

sampling means responsive to said timing and keying signals for periodically sampling signals processed by said chrominance channel during alternate line intervals, for deriving an identification signal representative of the timing condition of said burst component; and

means for coupling said identification signal to said timing means for controlling the operation of said timing means such that timing signals corresponding to correct line to line switching are provided.

4,133,003

RASTER REGISTRATION SYSTEM FOR A TELEVISION CAMERA

Robert E. Flory, and Charles B. Oakley, both of Princeton, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 11, 1977, Ser. No. 841,196
Int. Cl.[2] H04N 9/09
U.S. Cl. 358—51 **7 Claims**

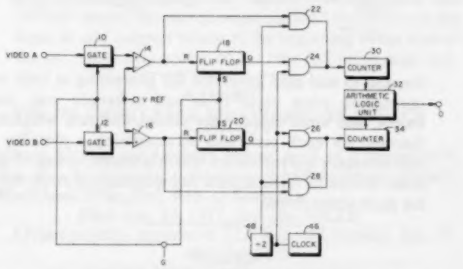
1. A raster registration system for a television camera including at least two image pickup devices and means for developing related television rasters, said television rasters differing in position relative to each other with regard to a common scene imaged on said devices, comprising:

means for inserting a common signal generating reference having first and second boundaries in the image path of said image pickup devices for generating respective first and second raster related signals in said devices;

means for selecting at least one television line common to said television rasters, said line containing said raster related signals, said signals increasing in amplitude from said first boundary to a peak amplitude intermediate said first and second boundaries and decreasing in amplitude from said peak amplitude to said second boundary;

means for providing a common time reference on said common television line, said common time reference occurring prior in time and position to said common signal generating reference;

clock means for developing first and second reference frequencies;



first and second signal translating channels each having signal detector means for developing respective first and second gating signals when said first and second raster related signals exceed a given reference level;

first and second counter means coupled to said clock means and responsive to said common time reference signal and said respective first and second gating signals for counting said first frequency from said common time reference to said first and second gating signals, and for counting said second frequency during the duration of said gating signals, the total count of said first and second counters indicating the position of the peak amplitude of said raster related signals relative to said common time reference;

control means coupled to said first and second counters for developing a control signal in response to the difference in the counts of said counters indicative of the difference in position of said related television rasters; and

means coupled to said raster developing means responsive to said control signal for minimizing said raster position difference.

4,133,004

VIDEO CORRELATION TRACKER

John M. Fitts, Santa Monica, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 2, 1977, Ser. No. 847,866
Int. Cl.[2] H04N 3/00
U.S. Cl. 358—125 **27 Claims**

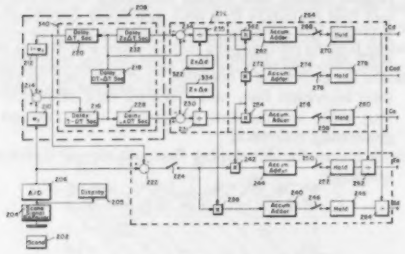
1. A correlation tracker for generating correlation tracking error signals said tracker having a receiver for receiving electromagnetic information from a scene to form an input signal having a plurality of sets of pixel values each set representing pixel data for one video frame, said correlation tracker comprising:

(a) a reference map generator for receiving said pixel values and generating a reference map having a plurality of reference map values corresponding to said pixel values;

(b) a weighting function generator coupled to said map generator for generating at least one weighting value for each pixel value;

(c) a scale factor generator coupled to said weighting function generator for combining the weighting values to form at least one pixel correlation scale factor and accumulating said pixel correlation scale factors to form at least one correlation scale factor for each video frame; and

(d) a correlation error signal generator coupled to said weighting function generator, to said scale factor generator, and to said map generator for generating at least one correlation error value from said reference map pixel values, said input signal pixel values, and said weighting function for each pixel and accumulating a plurality of said correlation error values which is scaled by one of said scale factors to form at least one correlation error signal for each video frame.



4,133,005

APPARATUS FOR THE TREATMENT OF INFORMATION IN AN OPTICAL FORM

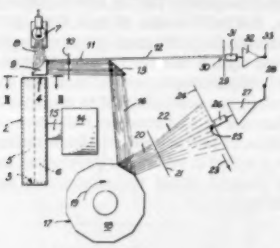
Bernard Golay, 62 rue Vasco de Gama, 75015 Paris, and Daniel Mouléne, 12 Impasse du Ruisseau, 74000-Annecy-le-Vieux, both of France

Filed May 26, 1976, Ser. No. 690,328

Claims priority, application France, May 28, 1975, 75 16697

Int. Cl.[2] H04N *5/86, 5/88*

U.S. Cl. 358—132 **18 Claims**



1. Apparatus for reproducing information of an optical character recorded on a flexible, opaque tape of a type having at least one track of images composed of informations having a high resolution such that they are indiscernible to the naked eye, said apparatus comprising, in combination:

(A) support means for said flexible tape;

(B) means defining a presentation zone;

(C) at least one feed means for advancing said tape along a path of movement to and through said presentation zone; and

(D) a tape reading assembly for reading the tape during movement of the tape and including

(a) a fixed luminous source for providing a luminous scanning flux directed to said presentation zone, and

(b) means for analyzing said tape line by line comprising at least one photosensitive device positioned to receive a beam of luminous flux reflected by the tape at said presentation zone, for transforming the variations in luminous intensity into electrical signals.

4,133,006

PREDICTIVE ENCODER OR DECODER WITH SELECTION OF ONE OF TWO OR MORE PREDICTION SIGNALS ACCORDING TO PREDICTION ERROR SIGNAL AMPLITUDES

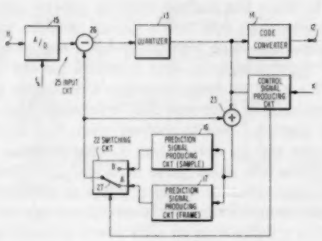
Kazumoto Iinuma, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Oct. 25, 1977, Ser. No. 844,857

Claims priority, application Japan, Oct. 22, 1976, 51-126866

Int. Cl.[2] H04N *7/12*

U.S. Cl. 358—133 **6 Claims**



1. A system for carrying out prescribed one of predictive encoding of an autocorrelated signal into a prediction error signal and predictive decoding of said prediction error signal into a reproduction of said autocorrelated signal, said autocorrelated signal taking those values at equally spaced successive instants which are substantially correlated to the values said autocorrelated signal takes each of at least two predetermined durations after said instants, a first of said predetermined durations being equal at least to the equal spacing between two adjacent ones of said instants, a second of said predetermined durations being longer than said first predetermined duration, said prediction error signal having an amplitude variable from one of said instants to another thereof in complicance with said autocorrelated signal, said system comprising:

a plurality of prediction signal producing means responsive to a first signal for producing at least two prediction signals, a first and a second of said prediction signals being predictive, at the respective ones of said instants, of the values said autocorrelated signal takes said first and second predetermined durations, respectively, after said respective instants;

control signal producing means responsive to said prediction error signal for producing a control signal depending on the amplitude said prediction error signal has at each of said instants;

switching means responsive to said control signal for selecting one of said at least two prediction signals to produce a second signal at an instant next succeeding said each instant;

adder means for producing a sum signal of said second signal and said prediction error signal;

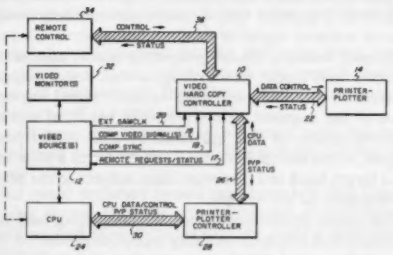
means for supplying said sum signal to all of said prediction signal producing means as said first signal; and

input means responsive to said autocorrelated signal and said second signal for producing said prediction error signal when said system is for carrying out the predictive encoding and output means responsive to said sum signal for producing said reproduction when said system is for carrying out the predictive decoding.

4,133,007
VIDEO DATA DETECT CIRCUITS FOR VIDEO HARD COPY CONTROLLER

Louis E. Wessler, Cupertino, and Kenneth F. Koch, Moutain View, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 17, 1977, Ser. No. 843,011
Int. Cl.[2] H04N *1/40*
U.S. Cl. 358—280 **6 Claims**



1. Video data detect circuits for a video hard copy controller of the type that converts and formats a video signal into a digital signal for application to a hard copy generating device, such video signal including a video data component and a synchronization component including horizontal synchronization (HS) periods, and said video hard copy controller including means for generating sample clock pulses at a frequency proportional to said HS periods, said video data detect circuits comprising:

first means for generating a predetermined video threshold reference signal;

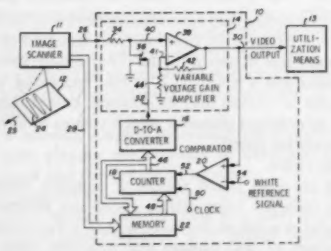
second means coupled to said first means and responsive to said video signal and to said predetermined reference signal for generating a binary signal at one state for so long as the voltage level of said video signal exceeds that of said predetermined reference signal, and at another state for so long as the voltage level of said video signal is less than that of the predetermined reference signal; and

third means coupled to said second means and responsive to said sample clock pulses and to said binary signal for coherently sampling the state of said binary signal at a predetermined transition of each sample clock pulse in order to generate said digital signal.

4,133,008
AUTOMATIC ILLUMINATION COMPENSATION CIRCUIT

James G. Tisue, Mountain View, Calif., assignor to Rapicom Inc., Santa Clara, Calif.

Filed Mar. 14, 1977, Ser. No. 777,095
Int. Cl.[2] H04N *1/38, 5/19*
U.S. Cl. 358—282 **7 Claims**



3. An illumination compensation circuit for use in modifying the output of a single mode image scanning device to dynamically compensate for luminosity and optical nonuniformities comprising:

means responsive to a count signal and operative to commensurately modify the amplitude of the signal output by the scanning device so as to develop a compensated scanning signal;

comparator means for comparing said compensated signal to a reference signal and for generating a comparison signal when said compensated signal exceeds the magnitude of said reference signal;

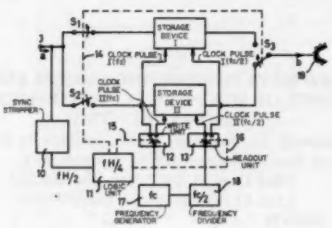
counter means responsive to said comparison signal and operative to begin counting at a predetermined rate from an input count and to develop a continuous output count signal until the count is terminated; and

memory means having a predetermined number of storage sites, each corresponding to particular sectors of a line scanned by the scanning device, said sites being addressed by signals from the scanning device and operative to store corresponding output count signals received from said counter means, the stored count signals being read out for input to said counter means at the beginning of the scan of the corresponding sector of the next following scan line.

4,133,009
COLOR VIDEO TAPE RECORDING/PLAYBACK SYSTEM

Wolfram Kittler, and Gerhard Rotter, both of Ludwigshafen, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland/Pfalz, Fed. Rep. of Germany

Filed Jan. 13, 1977, Ser. No. 759,122
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1976, 2602420
Int. Cl.[2] H04N *5/785;* **G11B** *15/00*
U.S. Cl. 360—9 **16 Claims**



1. A record/playback system for color video signals in which only every n^{th} partial picture is sampled to obtain a picture sample signal and recorded on magnetic tape, and the recorded picture sample signals are scanned n times at clock frequency for reproduction, said system comprising:

electronic signal storage apparatus;

means for writing, prior to recording, every n^{th} picture sample signal into said signal storage apparatus at clock frequency for storage therein for the duration of said picture sample signal while skipping the picture sample signals between said nth signals; and

means for reading out of said storage apparatus, and recording, the stored picture sample signals, at $1/n^{th}$ of the clock frequency.

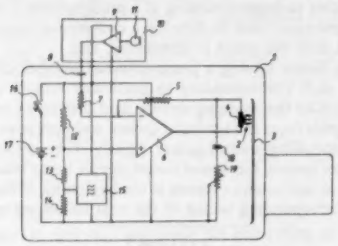
4,133,010
SOUND RECORDING APPARATUS

Horst Rossbach, Eichenau, Fed. Rep. of Germany, assignor to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed May 4, 1977, Ser. No. 793,868
Claims priority, application Fed. Rep. of Germany, May 6, 1976, 2620116
Int. Cl.[2] G11B *5/02*
U.S. Cl. 360—68 **5 Claims**

1. In a sound recording apparatus, particularly for use in motion-picture cameras and the like, in combination, a sound

recording head including an induction coil means; an operational amplifier having input means and output means; negative-feedback resistor means connected together with the induction coil means between the input means and the output means of the operational amplifier to form the negative-feedback branch of the operational amplifier; load resistance means connected to the junction between the feedback resistor means and the induction coil means; means for applying to the input means of the operational amplifier an audio-frequency audio signal and a higher-frequency magnetic biasing signal, the



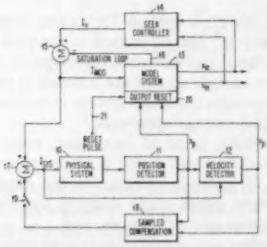
open-loop gain of the operational amplifier being at least one order of magnitude greater than the gain of the amplifier when the aforementioned negative-feedback branch is connected thereto, the resistance of the feedback resistor means being at least one order of magnitude greater than the impedance of the induction coil means at the frequency of the magnetic biasing signal, and the resistance of the load resistance means being at least one order of magnitude smaller than the impedance of the induction coil means at the frequency of the magnetic biasing signal.

4,133,011

SAMPLED DATA POSITIONING SYSTEM EMPLOYING A MODEL OF THE PHYSICAL SYSTEM FOR TIME OPTIMAL CONTROL

Fred Kurzweil, Jr., Saratoga, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1977, Ser. No. 863,832
Int. Cl.[2] G11B *21/08*; G05B *13/00*
U.S. Cl. 360—78 **27 Claims**



10. A head positioning system for moving read/write heads between data tracks of a disk file of the type in which servo positioning information is located in sectors on the disk surface to define the position of said data tracks which are interspersed with said servo information;

said positioning system comprising a physical system having a motor for moving said heads radially over said disk in response to motor control signals;

clocking means for generating timing signals synchronized with the passage of servo sectors beneath said heads as said disk rotates;

position sampling means responsive to said timing signals to provide a sampled position signal representing the radial position of said heads with respect to a target track at a sampling time defined by said timing signals;

velocity sampling means responsive to said timing signals to provide a sampled signal representing the velocity of said heads radially of the disk at a sampling time defined by said timing signals;

said system further comprising:

a model system which is an approximate electrical analog of the physical system and is responsive to a model control signal to provide a continuously available model position signal at a position output and a continuously available model velocity signal at a velocity output;

a reference velocity signal generating means connected to receive said model position signal and being responsive thereto to provide a reference velocity signal representative of the required velocity of said heads, at a position corresponding to that indicated by said model position signal, to permit said heads to decelerate to a state of rest at a target track in a minimum time, subject to the physical constraints on the system;

control signal generating means for comparing said model velocity and reference velocity signals to produce a velocity error control signal representative of their difference;

means for deriving from said velocity error control signal a motor control signal for said physical system and a model control signal for said model system;

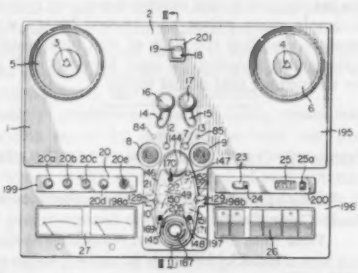
and means for resetting said model position and velocity signals in response to predetermined ones of said timing signals to the values of said sampled position and velocity signals.

4,133,012

MAGNETIC RECORDING AND REPRODUCING DEVICE

Takehisa Takamiya, Hirakata; Yoshiro Yano, Moriguchi, and Yuji Nakamura, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 27, 1976, Ser. No. 726,636
Claims priority, application Japan, Oct. 3, 1975, 50-120173
Int. Cl.[2] G11B *15/29*; B65H *17/22*
U.S. Cl. 360—90 **7 Claims**



1. A magnetic recording and reproducing device of the type wherein the tape is transported from one reel mounted on one spindle to the other reel mounted on the other spindle through a tape drive means and a head block so that recording, playback, fast-forward or rewind may be effected, comprising:

(a) a capstan of constant diameter which rotates at a predetermined constant speed,

(b) a rotatable roller,

(c) a pair of identical pinch rollers of constant diameter which are disposed symmetrical about the bisector or perpendicular erected at the mid-point of a line connecting the centers of said capstan and rotatable roller and which are selectively pressed against said capstan from the opposite directions, the lines of contact between the pinch rollers and capstan being symmetrically located such that the angle formed between (i) a line connecting

the centers of a pinch roller and the capstan and (ii) a line connecting the centers of the capstan and idler roller forms an obtuse angle,

(d) spring means for urging said pinch rollers against opposite sides of said capstan with equal force and pressure, so that one pinch roller is caught by the capstan and the other pinch roller releases from the capstan and exhibits a predetermined slip with respect thereto,

(e) a head block disposed between said capstan and said roller and including a plurality of heads,

(f) a first tape drive provided by said capstan and one of said pinch rollers and a second tape drive provided by said capstan and the other pinch roller,

(g) the tape transported by said first tape drive being directed toward said roller, where said tape is re-directed toward said second tape drive which drives said tape toward said the other reel,

(h) said tape being brought into contact with the heads in said head block between said first and second tape drives, and

(i) the speed imparted to said tape from said first tape drive being slower than the speed imparted to said tape from said second tape drive so that the ratio n between them may be

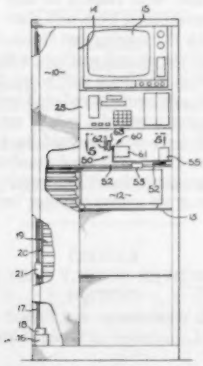
$$0.997 \leqq n \leqq 1.$$

4,133,013

VIDEO CASSETTE CHANGER-PROGRAMMER

Robert M. Fisher, Santa Monica, Calif., assignor to Programmable Systems, Inc., Hawthorne, Calif.

Filed Feb. 4, 1977, Ser. No. 765,441
Int. Cl.[2] G11B *15/68, 23/04*
U.S. Cl. 360—92 **3 Claims**



1. An improved cassette changer for use in combination with an automatic, programmable video cassette player-changer having plurality of video cassette players which use video cassettes containing visual material for a television audience and a television monitor electrically coupled to each of the plurality of video cassette players including:

a. a plurality of vertically stacked cassette trays, each of said cassette trays adapted to contain one of the video cassettes;

b. a housing adapted to contain the plurality of video cassette players, the plurality of vertically stacked cassette trays and the television monitor;

c. a support member adapted to maintain plurality of vertically stacked cassette trays in a fixed position;

d. a first motor adapted to be driven bidirectionally in response;

e. a screw adapted to extend the approximate height of the housing and mechanically coupled to the first motor;

f. first coupling device for coupling the support member to the screw, the coupling device being mechanically coupled in such that the support member is raised or lowered by the ratio of the screw;

said improved cassette changer comprising:

a. a return and retrieve plate that has four corners adapted to enclose the edges of a video cassette and an opening adapted to allow the video cassette to pass through it, said return and retrieve plate also having an edge adapted to contact the first edge of the video cassette;

b. four nylon bearings, each of which is attached in one of said corners of said return and retrieve plate;

c. a pair of parallel support and guide rods disposed perpendicular to the plurality of vertically stacked cassette trays in the horizontal plane, said support and guide rods mechanically coupled to said return and retrieve plate by said nylon bearing so that it may move laterally in the horizontal plane;

d. a pair of L-shaped members, each of which is coupled to one of said corners of said return and retrieve plate adjacent to the rear edge of the video cassette;

e. a first mechanical means for puiling and pushing said return and retrieve plate in a lateral direction; and

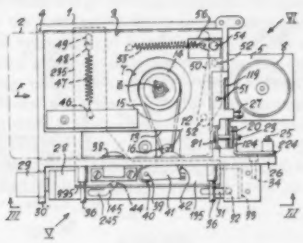
f. pressing means for pushing down upon the top of the video cassette player.

4,133,014

APPARATUS FOR REPRODUCING AND/OR RECORDING MAGNETIC TAPE IN CASSETTES

Nardino Righi, Milan, Italy, assignor to Ri-El Ricerche Elettroniche S.p.A., Cologno Monzese, Italy

Filed Jul. 20, 1977, Ser. No. 817,468
Claims priority, application Italy, Jul. 23, 1976, 12729 A/76
Int. Cl.[2] G11B *15/66, 21/22, 5/54*
U.S. Cl. 360—96 **4 Claims**



1. An apparatus for reproducing and/or recording magnetic tape in cassettes comprising, in combination,

(a) a cassette receptacle having an interior into which a cassette is introduced in a predetermined direction of introduction and expulsion;

(b) a carrier plate, means supporting said carrier plate on said receptacle for movement towards and away from said cassette receptacle, at least a drive capstan and a tape reel driving shaft mounted on said carrier plate for engagement with the cassette introduced into said cassette receptacle interior when said plate is moved towards said receptacle;

(c) a manually operated control slide, means for supporting said control slide on said receptacle for reciprocating movement in a direction parallel to the direction of introduction of the cassette, spring means for urging said carrier plate towards said receptacle for coupling engagement therewith, and means for mechanically connecting said control slide to said carrier plate for effecting a movement of said carrier plate away and apart from said cassette receptacle against the urging of said spring means upon movement of said control slide;

(d) a carrier element, means supporting said carrier element on said receptacle for relative movement towards and away from said receptacle, a magnetic head and pinch

roller mounted on said carrier element, means for biasing said carrier element towards said receptacle for operative engagement between the magnetic head and punch roller on said element and a cassette introduced into said receptacle interior, and means for operatively connecting said control slide to said carrier element for effecting the movement of said carrier element away and apart from said cassette receptacle against the force of said biasing means upon movement of said control slide;

(e) locking means on said receptacle for locking said carrier plate in said position away and apart from said cassette receptacle, means for biasing said locking device into said locking position in the absence of a cassette in said receptacle interior, means actuated by the introduction of a cassette into the interior of said cassette receptacle for moving said locking means from said locking position to a release position against said biasing means to permit said carrier plate to move into coupling engagement with said cassette receptacle under the urging of said spring means

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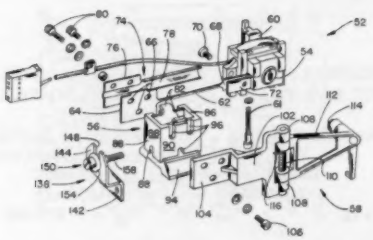
4,133,015

HEAD POSITIONER FOR DISC RECORDERS

Otto R. Butsch, Ann Arbor, Mich., assignor to Sycor, Inc., Ann Arbor, Mich.

Filed Mar. 16, 1977, Ser. No. 778,137
Int. Cl.[2] G11B *21/24, 5/56*
U.S. Cl. 360—109 **5 Claims**



1. In a data recorder/reproducer device of the type including a lead screw drive element, a follower carriage operatively engaged by the lead screw drive element and a disc holder for receiving a flexible disc, and improved, adjustable head positioner comprising:

a carriage extender securable as a cross-member to said carriage and extending laterally outwardly therefrom, said extender defining a guide track spaced from but extending alongside of the longitudinal axis of said drive element;

a head mount member including a first glide disposed for sliding movement only within said guide track, said first glide having a configuration conforming to the configuration of said guide;

a recorder/reproducer head secured to said head mount member and positioned at the side of said disc holder;

manually adjustable means carried by said extender and threadably engaging said head mount member for adjusting the position of said glide upon, said guide track by moving said glide along the guide track, said head mount member further including a second glide extending generally parallel to said first glide; and

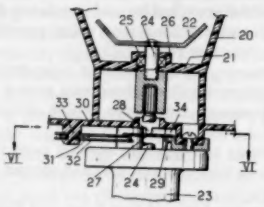
a clamp member mounted on said carriage extender and releasably clamping said second glide to thereby clamp said head mount member on said extender.

4,133,016

APPARATUS DRIVEN BY AN ELECTRIC MOTOR AND INCORPORATING A SAFETY DEVICE

Pierre Tanguy, Dardilly, France, assignor to SEB S.A., Selongey, France

Filed Aug. 22, 1977, Ser. No. 826,549
Claims priority, application France, Sep. 14, 1976, 76 27587
Int. Cl.[2] H02H *7/08*
U.S. Cl. 361—23 **9 Claims**



1. In an apparatus comprising a vessel for receiving a liquid, an electric motor, means mounting the electric motor below the vessel, a drive shaft extending into the vessel and in driving connection with said electric motor, a seal around said drive shaft for sealing the vessel with respect to said drive shaft and electrical conductor means for conducting electrical current to said electric motor, the improvement comprising a safety device for interrupting energization of the electric motor in the event of leakage of said liquid past said seal, said safety device including a safety switch inserted in said electrical conductor means, means biasing said safety switch towards an open position, and means holding said safety switch in a closed position, the last mentioned means including a plate disposed outside said vessel below said seal, plate supporting means supporting and locating said seal with respect to said vessel, said plate acting as a beam transmitting from said plate supporting means to said safety switch the mechanical forces required to retain said safety switch in the closed position, said plate being made of a material which is relatively stiff when dry but which has its bending strength substantially reduced when wetted by said liquid, whereby in the event of a leak of said liquid from said seal, said plate will be wetted by said liquid and will consequently be weakened and will bend to allow said switch to move to its open position thereby interrupting the supply of current to said motor via said conductor means.

4,133,017

ELECTRICAL POWER SUPPLY FAULT DETECTING SYSTEM

Lauren L. Johnson, Westchester, and Robert J. Wilson, Bolingbrook, both of Ill., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 28, 1977, Ser. No. 855,164
Int. Cl.[2] H02H *3/28*
U.S. Cl. 361—42 **5 Claims**

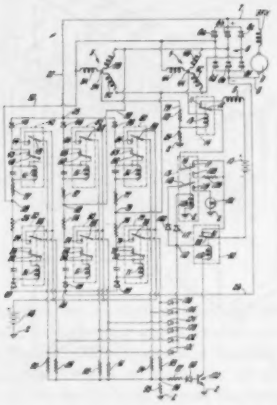
1. An electrical power supply fault detecting system for use with an alternator of the type having an exciting field winding connected in an energizing circuit including an energizing potential source and two discrete parallel connected polyphase output winding groups each having a neutral point, comprising:

a diode bridge type polyphase rectifier circuit for full wave rectifying the output potential of said alternator output winding groups;

means for applying the rectified output potential of said rectifier circuit across an output circuit isolated from a selected point of reference or ground potential;

circuit means including the series combination of a first resistor and the actuating means of an electrically operable switching device interconnecting said neutral points of said output winding groups, said switching device having normally conductive electrical current carrying means

connected in series in said exciting field winding energizing circuit whereby a flow of current through said circuit means as a result of an alternator output winding turn to turn short effects the operation of said switching device to interrupt said exciting field winding energizing circuit; and



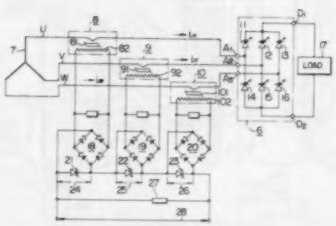
a second resistor connected across the junction between said first resistor and said actuating means of said switching device and said selected point of reference or ground potential whereby a system fault to said selected point of reference or ground potential effects the operation of said switching device to interrupt said exciting field winding energizing circuit.

4,133,018

THYRISTOR FAULT-DETECTING APPARATUS

Mutsuhiro Terunuma, Mito; Seiya Shima, Katsuta; Korefumi Tashiro, Hitachi; Takeki Ando, Nakamachi; Hiromi Inaba, Hitachi; Toshiaki Kurosawa, and Hiroaki Kuroha, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jun. 14, 1977, Ser. No. 806,595
Claims priority, application Japan, Jun. 18, 1976, 51-71822
Int. Cl.[2] H02H *7/12*
U.S. Cl. 361—87 **6 Claims**



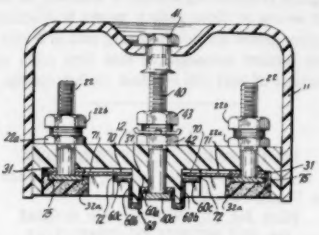
1. A thyristor fault-detecting apparatus comprising a thyristor bridge including n thyristor arms with A.C. terminals connected to a multi-phase A.C. power supply, and an inductive load connected to the D.C. terminals of said thyristor bridge; said apparatus further comprising means provided respectively for multi-phase lines connecting to said power supply and said A.C. terminals, said means generating an electrical signal which, rising with the rise of currents of said respective lines, disappears at an earlier one of a time point after the lapse of $2\pi/n$ to $4\pi/n$ from said rise of said electrical signal and a time point when said line currents disappear, and detection means actuated in response to the disappearance of all of said electrical signals associated with said respective phases.

4,133,019

AIR GAP BACK-UP SURGE ARRESTER

Alfred J. Roach, Lindenhurst, and Charles Roberts, Rosedale, both of N.Y., assignors to TII Corporation, Lindenhurst, N.Y.

Filed Nov. 12, 1976, Ser. No. 741,247
Int. Cl.[2] H02H *3/22*
U.S. Cl. 361—124 **3 Claims**



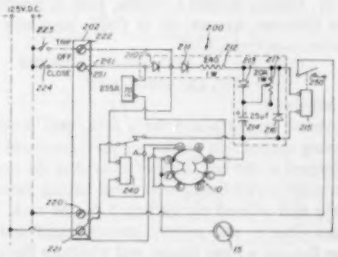
1. In a gas tube protector assembly for a protected circuit, said assembly being adapted to contain a gas tube having three electrodes and wherein said assembly includes (1) a housing base, (2) resilient clips therein for receiving the gas tube, (3) terminal conductors therein for interconnecting said gas tube electrodes with said protected circuit said terminal conductors including a common conductor and a pair of line conductors disposed on opposite sides of said common conductor, (4) a fusible element located to sense excessive heat in said gas tube, and (5) a shorting and grounding assembly arranged to respond to fusing of the fusible element to short circuit and ground the gas tube, the improvement comprising a plurality of gap forming conductor elements in said base including-common pole face forming means conncted to said common conductor, extending laterally therefrom towards said line conductors and terminating with a blade-shaped section in overlapping and spaced relationship with a similarly configured pole face of said line conductors, thereby defining a pair of air gaps, and means for enclosing said air gap configuration.

4,133,020

CONTROL SWITCH RELAY AND CONTROL CIRCUIT MEANS

Alexander MacLean, Hingham, Mass., assignor to Electro Switch Corp., Weymouth, Mass.

Continuation-in-part of Ser. No. 729,114, Oct. 4, 1976, Pat. No. 4,106,072, which is a division of Ser. No. 591,170, Jun. 27, 1975, Pat. No. 4,001,740. This application Jun. 29, 1977, Ser. No. 811,198
Int. Cl.[2] H01H *47/02*
U.S. Cl. 361—156 **15 Claims**



1. A control circuit means for operating a remote controlled

switch comprising a rotary solenoid positioned to engage a switch shaft carrying radially positioned contacts, and a linear solenoid,

said circuit means comprising trip switch means and close switch means for interconnection with means for supplying a trip power input or close power input respectively,

first relay means responsive to actuation of one of said trip switch means or close switch means to actuate said rotary solenoid and index said shaft to a preselected position, hold said position for a preselected time and then return to its original position regardless of whether or not said trip switch means or close switch means is deactuated,

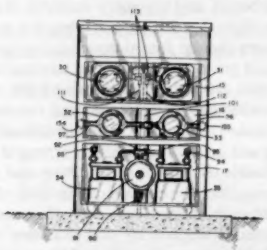
second relay means for deenergizing said first relay means to prevent further actuation of said first relay means until deactuation of said trip or close switch means.

4,133,021

MULTIPLE UTILITY PEDESTAL

Harold M. King, and Melvin L. Lesher, both of 5425 Longridge Ave., Las Vegas, Nev. 89102

Filed Jul. 25, 1977, Ser. No. 818,845
Int. Cl.[2] A47B *81/00*; G01F *15/14*
U.S. Cl. 361—365 **14 Claims**



1. A pedestal for housing utility metering devices for a plurality of users comprising a housing, a first compartment within said housing for containing electrical utility metering devices, mounting means in said first compartment for securing at least two electrical utility meters therein, a second compartment for containing at least two water meters, third and fourth compartments adjacent and having a common wall with said first compartment for containing electrical shutoff devices, compartments adjacent to and having a common wall with said second compartment for containing water shutoff devices, apertures in said common walls to permit passage of utility conduits, and door means for each of said compartments to permit access thereto from outside of the pedestal.

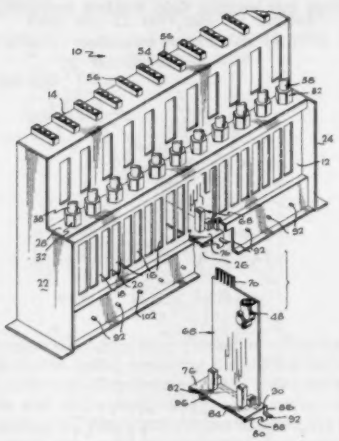
4,133,022

RACK ASSEMBLY

Leonard W. Moore; Ronald L. Bodle, both of Northridge, and Conrad Fiederer, Agoura, all of Calif., assignors to Moore Industries, Sepulveda, Calif.

Filed Jan. 17, 1977, Ser. No. 759,883
Int. Cl.[2] H02B *1/02*
U.S. Cl. 361—415 **4 Claims**

1. A printed circuit board for a rack, said printed circuit board having spaced side portions, a male electrical connector portion formed at one end, a panel secured to the opposite end of said printed circuit board, said panel having means thereon for locking said printed circuit board on the rack, said panel being transverse to said printed circuit board and provided with edge flanges, a front flange, and a bottom flange defining a rod receiving groove, axially aligned rod receiving holes formed in the edge flanges, a rod extending through said holes, a handle on one end of said rod, the opposite end of said rod extending through a rod receiving hole and serving as a detent, stop means formed on the rod, a coil spring mounted on the



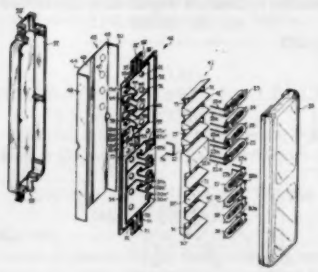
rod bearing against the stop member and a flange to bias the rod so said opposite end projects through said hole.

4,133,023

FLASH LAMP ARRAY HAVING ELECTRICAL SHIELD

James M. Hanson, Euclid, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 14, 1977, Ser. No. 860,438
Int. Cl.[2] G03B *15/02*
U.S. Cl. 362—11 **8 Claims**

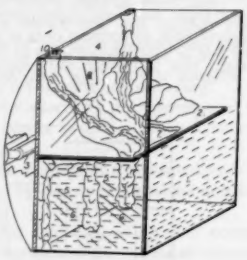


1. A multiple flash lamp array comprising a vertically elongated circuit board having circuitry for sequentially firing flash lamps and a plurality of elongated flash lamps of the electrically fired type positioned over the front of said circuit board and lying horizontally and stacked vertically and having lead-in wires at the side ends thereof connected electrically to said circuitry, and an electrically conductive shield in the form of a conductive sheet member positioned behind and substantially parallel to said circuit board, said shield being provided with side portions extending frontwardly of said circuit board and substantially flanking said flash lamps, wherein the improvement comprises electrically insulative flash indicator material on the inside surface of said shield and extending on said side portions thereof to insulate said lead-in wires from said shield.

4,133,024
BEHIND THE SCENE LIGHTS

Otto A. Roehrick, 1333 Elk Horn Blvd., Rio Linda, Calif. 95673

Filed Mar. 8, 1976, Ser. No. 664,757
Int. Cl.[2] F21V *33/00*; A01K *63/00*
U.S. Cl. 362—101 3 Claims

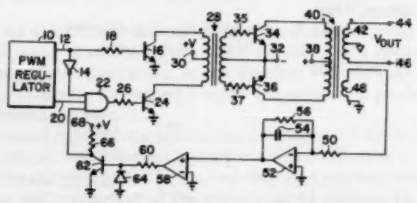


1. In combination, an Ecolarium (ecology tank), a lower aquis portion and an upper sky and terranius portion, a background like horizontally concaved cover forming a concaved arch; a light source mounted in the center of said arch; said cover being fitted on the backside of said Ecolarium, the light rays from said source shining simultaneously downward into the portion of the aquis and upward into the sky and terranius area.

4,133,025
PULSE WIDTH MODULATOR SYMMETRY CORRECTION CIRCUIT AND METHOD THEREOF

Henry Wurzburg, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 28, 1977, Ser. No. 837,115
Int. Cl.[2] H02M *7/537*
U.S. Cl. 363—41 9 Claims



1. A regulator circuit for balancing the positive and negative flux density change in an inductive device driven by a voltage of a first polarity and a voltage of a second polarity comprising:

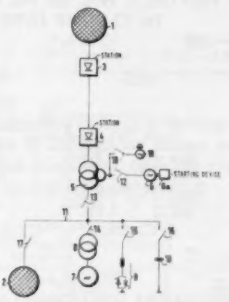
(a) detecting means coupled to said inductive device for determining the flux density change produced by said voltage of said first polarity; and

(b) means coupled to said detection means for controlling the duration of said voltage at said second polarity for balancing the positive and negative flux density change in said inductive device.

4,133,026
METHOD OF STARTING UP A HIGH-VOLTAGE D-C INVERTER OR TRANSMISSION STATION IN ISOLATED OR ISLAND OPERATION

Michael Häusler, Hirschberg, Germany, assignor to BBC, Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed Feb. 14, 1977, Ser. No. 768,497
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1976, 2605793
Int. Cl.[2] H02J *3/36*
U.S. Cl. 363—49 10 Claims

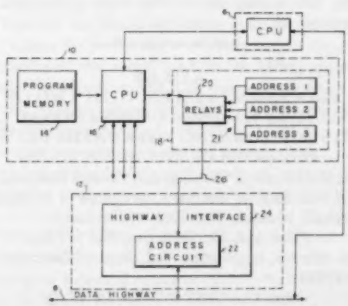


1. Method of starting up a station of a high-voltage d-c transmission system having at least two converters which with current and voltage regulators are connectible to d-c and three-phase networks or power plants and are selectively operable as rectifiers and inverters, and for starting up the three-phase network or power plant connected to the station, the station at the start-up time, being isolated from a functioning three-phase network or power plant and auxiliary equipment required for the operation thereof, which comprises feeding from the d-c side of the high-voltage d-c transmission system active power required for starting up the station of the high-voltage d-c transmission system, and feeding from an independent reactive-power source reactive commutation power required for the start-up operation of the station of the high-voltage d-c transmission system as well as other reactive power required during the start-up.

4,133,027
PROCESS CONTROL SYSTEM WITH BACKUP PROCESS CONTROLLER

James A. Hogan, Hatfield, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 13, 1977, Ser. No. 832,880
Int. Cl.[2] G06F *15/46*, *11/00*
U.S. Cl. 364—119 9 Claims



8. A method of substituting a backup controller for a failed primary controller on a data highway comprising the steps of

detecting the failure of a primary controller, substituting the data highway address of the failed controller into the backup controller and concurrently disabling a highway address circuit of said primary controller.

4,133,028

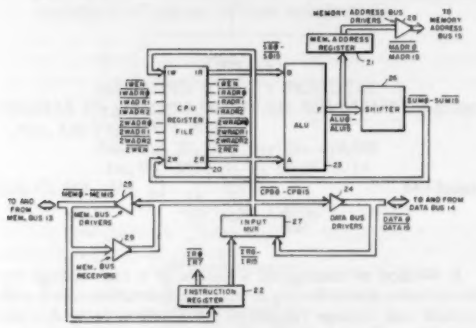
DATA PROCESSING SYSTEM HAVING A CPU REGISTER FILE AND A MEMORY ADDRESS REGISTER SEPARATE THEREFROM

David H. Bernstein, Ashland, Mass., assignor to Data General Corporation, Westboro, Mass.

Filed Oct. 1, 1976, Ser. No. 728,836

Int. Cl.[2] G06F *13/00*

U.S. Cl. 364—200 **6 Claims**



1. A data processing system comprising a central processor unit for processing address words and data words and one or more memory units for storing address words and data words, said central processor unit including

a skew protected quadriport register file having first and second read ports and first and second write ports;

an arithmetic-logic unit for performing arithmetic and logical operations on input information supplied thereto and having a pair of inputs, and an outut;

a shifter unit for supplying a shifted output therefrom to said register file and having an input and an output;

the first read port of said register file connected to one of said pair of inputs of said arithmetic-logic unit;

the second read port of said register file connected to the other of said pair of inputs of said arithmetic-logic unit and to the first write port of said register file; and

a memory address register separate from said register file for supplying addresses to said one or more memory units;

the output of said arithmetic-logic unit being connected to the input of said memory address register and to the input of said shifter unit, the output of said shifter unit being connected to the second write port of said register file for writing the shifted logic unit result into the register file.

4,133,029

DATA PROCESSING SYSTEM WITH TWO OR MORE SUBSYSTEMS HAVING COMBINATIONAL LOGIC UNITS FOR FORMING DATA PATHS BETWEEN PORTIONS OF THE SUBSYSTEMS

Hermann Ruckdeschel, Gauting, and Thomas Rambold, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 20, 1976, Ser. No. 678,621

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1975, 2517553

Int. Cl.[2] G06F *3/04, 9/18, 13/00*

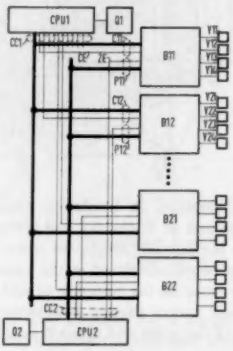
U.S. Cl. 364—200 **8 Claims**

1. A data processing system formed into subsystems, comprising:

a plurality of peripheral units,

at least two control units, each of which is assigned to a given one of said subsystems,

a plurality of integrated logic units, each of which is assigned to a given one of said control units, each said logic unit comprising a buffer store, a plurality of input-output gates and means for connecting the said assigned control unit to the integrated logic unit, said input-output gates being operable, respectively, to connect ones of said peripheral units and the one of said control units to which the logic unit is not assigned to that logic unit, said buffer store



having inputs and outputs connectable, respectively, to said input-output gates and said means for connecting and means responsive to control data from a said control unit for operating said input-output gates in a said integrated logic unit to participate in a data transfer in order to establish a data path for the data transfer via at least one of said input-output gates and via said buffer store, whereby data can be transferred via each said integrated logic unit between said control units or between a said control unit and a peripheral unit associated with a given integrated logic unit.

4,133,030

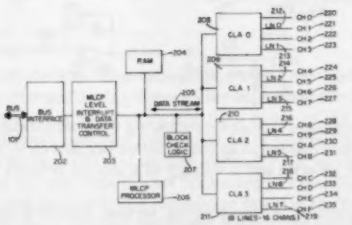
CONTROL SYSTEM PROVIDING FOR THE TRANSFER OF DATA IN A COMMUNICATIONS PROCESSING SYSTEM EMPLOYING CHANNEL DEDICATED CONTROL BLOCKS

Robert E. Huettner, Acton, Mass.; John P. Grandmaison, Hampton, N.H.; John H. Vernon, Milford, Mass.; Richard A. Lemay, Bolton, Mass., and Edward Beauchemin, Marlboro, Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jan. 19, 1977, Ser. No. 760,773

Int. Cl.[2] G06F *3/00, 13/00*

U.S. Cl. 364—200 **14 Claims**



1. A data processing system for transferring data included in a message comprising:

A. a main memory having a plurality of data blocks for storing said data, each of said data blocks having a starting

address and a range indicative of the number of storage locations in said block;

B. a plurality of communication channels;

C. an auxiliary memory including a plurality of control block storage locations for storing control information indicating the starting address, range and status of said data blocks in said main memory; and

D. means for transferring said message data between said data blocks in said main memory and said communcation channels under the control of said control information, said means for transferring including:

1. means for allocating a predetermined number of said control blocks in said auxiliary memory for each said channel,

2. means for loading said message data in said data block indicated by the starting address in a first said control block,

3. means for switching to another control block upon completing the transfer of data as indicated by the range in said first control block, and

4. means for generating an interrupt signal upon completing the transfer of all said message data as indicated by said status in the last said control block utilized to control the transfer of said message data.

4,133,031

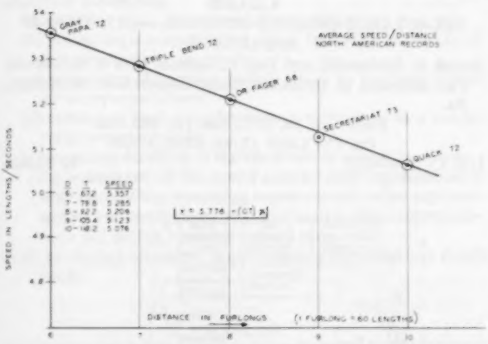
ELECTRONIC SPEED RATING CALCULATOR AND METHOD

Robert S. Sinn, New York, N.Y., assignor to Esrac Computer Corporation, New York, N.Y.

Filed Apr. 20, 1977, Ser. No. 789,123

Int. Cl.[2] G06F *7/38*

U.S. Cl. 364—412 **2 Claims**



1. An automatic speed rating computer for determining the speed rating of an entrant in a speed contest over a predetermined distance comprising, in combination:

a first register for storing a signal indicative of a predetermined distance,

a second register for storing a signal indicative of the desired entrant, which further comprises a signal indicative of the distance the desired entrant was behind a winning entrant at the completion of the predetermined distance by the winner,

a third register for storing a signal indicative of the time of the entrant who is the winner, of the contest to complete the predetermined distance,

means for accessing the signal from the first register, means for selectively accessing the signal from the second register and subtracting means for subtracting the signal from the second register from the signal from the first register,

division means for dividing the result of the aforesaid subtraction by the signal from the third register,

a first memory for selectively providing a signal indicative of a constant factor,

multiplication means for multiplying the signal from the first register by the signal from the first memory, and

means for adding the result of said multiplication to the result of said aforesaid division to determine a speed rating,

means for accessing another constant and subtracting said constant from said aforesaid addition, said constant being based on the ordinate intersection of the slope of a line which forms the linear relationship between speed and distance for a zero speed rating, and

all of said means being operating in accordance with the relationship:

$$\text{Speed Rating} = \frac{\frac{(f\,60 - L)}{(t)} + .07f - 4.92}{0.008}$$

where f is the predetermined distance in furlongs of the race and L is the distance in furlongs the entrant is behind the winner and t is the time in seconds it takes the winner to complete the race over the predetermined distance.

4,133,032

CRANE LOAD INDICATING ARRANGEMENT

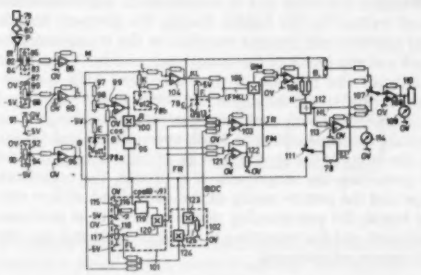
Alan M. Spurling, Benfleet, England, assignor to Pye Limited, Cambridge, England

Filed May 6, 1977, Ser. No. 794,395

Claims priority, application United Kingdom, May 14, 1976, 1976/76

Int. Cl.[2] G08B *21/00*; G06F *15/20*

U.S. Cl. 364—424 **6 Claims**

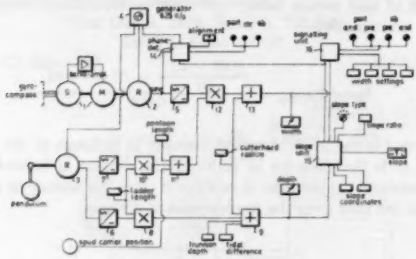


1. A load indicating arrangement for use with a crane or other lifting apparatus of the type having plural modes of operation comprising, law generator means including means to produce for each mode of operation of the lifting apparatus a reference output signal which is representative of the maximum safe load for the lifting apparatus in its prevailing operation mode, means for producing a working output signal which is representative of the actual load on the lifting apparatus in the prevailing operation mode, and means responsive to said reference and working signal outputs to provide an indication of available lifting capacity of the lifting apparatus, said law generator means comprising a digital storage device having a storage location individual to each mode of operation of the lifting apparatus, each storage location being adapted to store a plurality of items of information pertaining to the operating characteristics of the lifting apparatus for a particular mode of operation, selection means for selecting a storage location corresponding to a desired mode of operation, read-out means for reading out and temporarily storing the plurality of items of information from the selected storage location, and means responsive to the temporarily stored items of information for determining the value of said reference output signal.

4,133,033
DREDGE PROFILE COMPUTER FOR A CUTTER SUCTION DREDGE

Cornelis J. Noordermeer, Zwijndrecht, and Johannes Maas, Rotterdam, both of Netherlands, assignors to Observator B.V., Hoogvliet, Netherlands

Continuation-in-part of Ser. No. 777,733, Mar. 15, 1977. This application Dec. 22, 1977, Ser. No. 863,186
Int. Cl.[2] G06G *7/66;* E02F *3/18*
U.S. Cl. 364—424 **7 Claims**



1. A dredge profile computer for a cutter suction dredge consisting of a pontoon, a pivotally mounted ladder on said pontoon and provided with a head, and two spuds, one of which may be movable in the axial direction of the pontoon, said computer comprises a pontoon course data pick-up means, ladder angle transmitting means, a spud position transmitting means and means to introduce corrections relative to the draught of the pontoon in the computer, a plurality of data converting means, multiplier means and adder means to calculate from the swing angle and elevation angle of the ladder sine and cosine functions and in combination with transmitted or preset values for the ladder length, the pontoon length, the spud position and draught corrections the coordinates for the depth and the width of the cutterhead; and furthermore means to indicate the position of the cutterhead with respect to a planned profile and the depth and width of the cutterhead and in combination with said indicator means warning means for warning a dredge operator when approaching and/or exceeding the limits of the profile; and an adjustment and control unit for presetting the slope-ratio of a profile, the coordinates of slope and the end of sweep of the cutterhead at port side and star board; for pre-warning of the end of cut at port side and starboard, and for presetting the kind of slope and any draught and course adjustments.

4,133,034
METHOD AND MEANS OF ASSIMILATING UTILITY METER DATA

Berwyn E. Etter, 368 Boca Ciega Point Blvd. So., Madeira Beach, Fla. 33708

Filed Jul. 27, 1977, Ser. No. 819,350
Int. Cl.[2] G06K *1/00*
U.S. Cl. 364—464 **9 Claims**

1. A method of assimilating utility meter data at the meter locations, comprising,

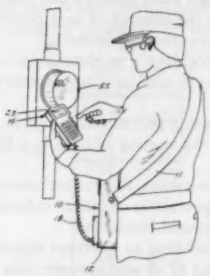
accumulating on an input information electronic storage means customer profile information for a plurality of meter customers, said profile information including the customer identity and account information,

placing said input information electronic storage means in a portable computer capable of being manually carried to the site of a given meter, said portable computer having an output information storage means and having the capability of updating, printing and presenting various of said customer profile information for said meter customers before and after receiving current customer profile information,

actuating said computer to segregate and to visually present from the customer profile information for a plurality of meter customers stored on said input information electronic storage means at least the meter number and customer identity information of a given meter customer,

imposing into said computer the current meter reading of said given meter customer at the site of the meter being read,

actuating said computer to calculate the charge for utility usage based upon the previous meter reading and said current meter reading,



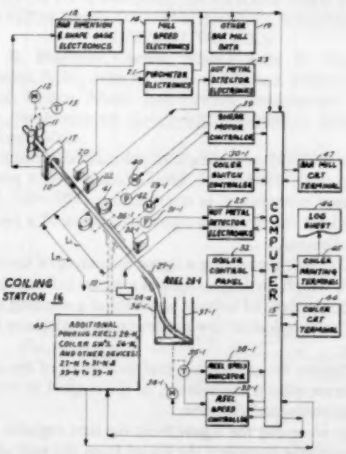
actuating said computer to print a bill for said meter customer at the site of said meter based upon said calculation and imposing on said output information storage means the updated customer profile information,

and depositing said bill at the service address of said given meter customer.

4,133,035
SELECTABLE COILING CONTROL METHOD AND APPARATUS

Joseph A. Grohowski, and Tom L. Galanis, both of Bethlehem, Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Aug. 16, 1977, Ser. No. 825,118
Int. Cl.[2] G06F *15/46;* B21C *47/28*
U.S. Cl. 364—472 **31 Claims**



1. In a coiling control system where a moving product is poured into a variable speed pouring reel to form layered coils therein, and where a product speed signal is generated, the improvement comprising:

a. means for calculating a selectable reel speed reference signal as a function of at least one parameter signal and at

least one selection signal, the parameter signal including the product speed signal and the selection signal including a reel speed wobble pattern selection signal,

b. means for producing at least one selection signal including the reel speed wobble pattern selection signal, and

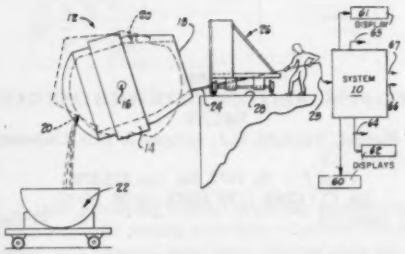
c. means for controlling the pouring reel speed in response to the selectable reel speed reference signal, thereby maximizing pouring reel coil density under a variety of coiling situations.

4,133,036

METHOD AND SYSTEM FOR MONITORING A PHYSICAL CONDITION OF A MEDIUM

Robert G. Watson, South Euclid, Ohio, assignor to Republic Steel Corporation, Cleveland, Ohio

Filed Feb. 26, 1976, Ser. No. 661,618
Int. Cl.[2] G01K *1/12, 17/00;* **G08B** *21/00*
U.S. Cl. 364—477 **21 Claims**



1. A method of approximately quantifying a sensed physical condition comprising:

(a) enabling a sensor to sense the condition;

(b) producing a sensor output signal indicative of the condition as sensed by the sensor;

(c) processing the sensor output signal to produce sample value representations;

(d) storing at least a predetermined number of said sample value representations;

(e) detecting dwelling of the condition as sensed by comparing at least one of the stored sample value representations with each of the remaining stored sample value representations and determining that said sample value representations fall within a predetermined range; and,

(f) producing an output approximating the condition dwell value.

4,133,037

SYSTEM AND METHOD OF PERFORMING A DECISIVE PHASE COHERENCE TEST

Kelly C. Overman, and Thelma L. Calder, both of Pikesville, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

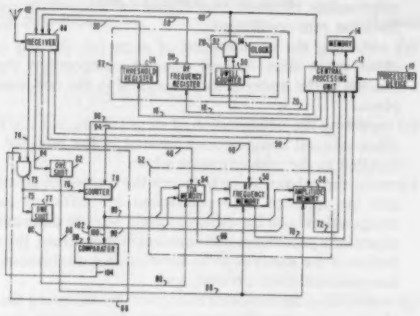
Continuation of Ser. No. 658,010, Feb. 13, 1976, abandoned. This application Jul. 21, 1977, Ser. No. 817,758
Int. Cl.[2] G06F *15/20;* **H03B** *3/04*
U.S. Cl. 364—484 **13 Claims**

1. A processing system for determining the phase coherency of propagating signals having characteristics of frequency, amplitude, pulse repetition interval and stagger level, said system comprising:

means for establishing predetermined periods of time;

means for segregating a first and second group of pulses from said propagating signals during each predetermined time period based on predetermined characteristics including frequency and amplitude; and

means for processing said first and second groups of pulses associated with each predetermined time period in accordance with a function based on predetermined characteristics including pulse repetition interval and stagger level, respectively associated with each group of pulses, to establish the relative phase of said first group with respect to said second group of pulses for each time period and for



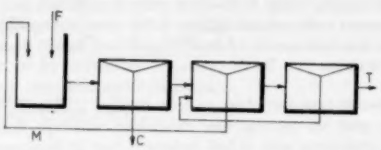
comparing the relative phases, established for each time period, to determine the phase coherency of said first and second groups of pulses.

4,133,038

METHOD OF CONSTRUCTING A CONTINUOUSLY OPERABLE FLOTATION CONCENTRATION PLANT

Antti Niemi, Yrgö Liipolantie 5, Kauniainen, Finland

Continuation-in-part of Ser. No. 799,940, May 24, 1977, abandoned, which is a continuation of Ser. No. 689,926, May 25, 1976, abandoned. This application Dec. 7, 1977, Ser. No. 858,353
Claims priority, application Finland, May 26, 1975, 751525
Int. Cl.[2] B03B *9/00, 13/00*
U.S. Cl. 364—502 **7 Claims**



6. A method of controlling a continuously operable flotation concentration plant, which method includes the steps of:

(a) conducting a mineral sample of uniform grain size and uniform mineral composition into water in a flotation cell, subjecting the mineral grains to conditioning by conducting a strongly adsorbable collecting agent into said water in an amount which is at least sufficient to create a monomolecular layer on the mineral grains, continuing the conditioning to allow a monomolecular layer to be formed and measuring the final concentration of the collecting agent thus letting the amount sufficient to create a monomolecular layer to be exactly determined,

(b) conducting a mineral sample similar to that in step (a) into water in said flotation cell, subjecting the mineral grains to conditioning by conducting a strongly adsorbable collecting agent into said water in an amount which is a fraction of the amount sufficient to create a monomolecular layer on the mineral grains, as determined by means of step (a), continuing the conditioning to allow the mineral grains to adsorb completely the collecting agent from the aqueous suspension so that the degree of adsorption attains a value corresponding to said fraction, subjectint the conditioned mineral grains to flotation by conducting air into the aqueous suspension, separating the floating mineral grains at time intervals during the flota-

tion and determining therefrom the flotation rate coefficient;

(c) repeating step (b) a plurality of times using a different degree of adsorption in each case thereby to determine the relationship between the degree of adsorption and the flotation rate coefficient

(d) repeating the combination of steps (a), (b) and (c) for other grain sizes of said mineral composition that are present in the material to be handled in the concentration plant,

(e) repeating the combination of steps (a), (b), (c) and (d) for other mineral compositions present in the material to be handled in the concentration plant,

(f) using the relationships between the degree of adsorption and the flotation rate coefficient for different mineral compositions and for different grain sizes to determine, by means of a predetermined simulation procedure, the distribution of the material to be handled in a continuous flotation concentration process, and

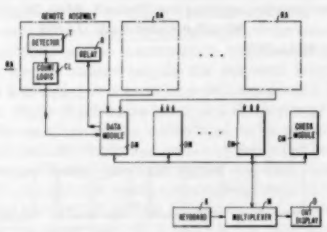
(g) controlling the concentration plant by adjusting the feeds of ore, water, conditioning chemicals and air to distribute the material continuously into concentrates, wastes and middlings, wherein the composition of said fractions is in accordance with the distribution as determined in step (f).

4,133,039

TRUE MEAN RATE MEASURING SYSTEM

Dennis P. Eichenlaub, Baltimore, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 9, 1976, Ser. No. 740,321
Int. Cl.[2] G06F *11/04*; G01T *1/00*
U.S. Cl. 364—554 **6 Claims**



1. A digital radiation monitoring system for developing a radiation level indication in response to output pulses from one or more radiation detectors and which optimizes the trade-off between the system statistical error, or resolution, and system response time, comprising,

at least one radiation detector means for producing output pulses indicative of a monitored radiation level,

a micro-computer circuit means having a memory and a program stored in said memory for determining the true mean rate of said output pulses, said micro-computer circuit means being operatively connected to said radiation detector means, said program including;

(a) an averaging routine for averaging the output pulses of said radiation detector means with respect to time at a plurality of averaging levels with each averaging level corresponding to a progressively increasing maximum count level of said output pulses, said micro-computer circuit means developing a best estimate measurement of the true mean rate of said output pulses as a measurement of the true mean radiation level, said best estimate measuring being the average of the averaging level of highest full count of said output pulses, the system statistical error decreasing as the averaging time increases from one full count averaging level to the next full count averaging level, and

(b) a statistical test routine for determining if the true mean rate of said output pulses is changing, and responding to a change in the true mean rate by reducing the averaging time of said averaging routine to optimize the trade off between the systems statistical error and response time in determining the best estimate measurement of the true mean rate of said output pulses,

said micro-computer means comparing said best estimate measurement of the true mean radiation level to a predetermined radiation alarm level and generating a radiation alarm output signal in response to a predetermined relationship between said best estimate measurement and said predetermined radiation level, and

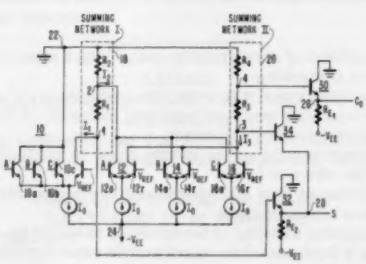
control circuit means responding to said radiation alarm output signal by initiating a radiation alarm response.

4,133,040

MULTI-FUNCTION LOGIC GATE WITH ONE GATE DELAY

Daniel Hampel, Westfield, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 30, 1977, Ser. No. 811,870
Int. Cl.[2] G06F *7/50*; H03K *19/08, 19/32*
U.S. Cl. 364—773 **17 Claims**



13. A logic circuit comprising:

means for supplying first through nth input signals, where n is an integer greater than one, each of said input signals assuming a first or a second logic level;

a threshold logic gate having first through nth input connections connected to receive respective ones of said first through nth input signals and having first and second output connections at which in-phase and out-of-phase current responses to said input signals, respectively, appear;

a first emitter-coupled logic gate having first through nth input connections connected to receive respective ones of said first through nth input signals and having an output connection at which a given output current is produced in response to a given condition of said input signals;

orring means having first and second input connections and having an output connection at which an output signal of said logic circuit is to be available;

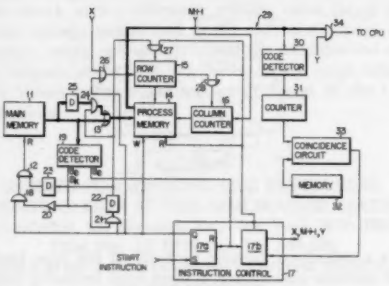
first summing combining means proportionally responsive to both of the out-of-phase current response of said threshold logic gate and the given output current of said first emitter-coupled logic gate to provide a signal applied to the first input connection of said orring means; and

second summing means proportionally responsive to the in-phase current response of said threshold logic gate to provide a signal applied to the second input connection of said orring means.

4,133,041
DATA PROCESSING CONTROL APPARATUS WITH SELECTIVE DATA READOUT

Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1976, Ser. No. 754,418
Claims priority, application Japan, Dec. 25, 1975, 50-156863
Int. Cl.[2] G06F *15/40, 9/20*
U.S. Cl. 364—900 9 Claims



1. A data processing control apparatus comprising: main memory means for storing a plurality of record data serially arranged with a record positioning code between the record data, each record data including a plurality of word data serially arranged with a word positoning code between the word data, said word data including at least one character;

processing memory means coupled to said main memory means for storing the record data read out of said main memory means, said processing memory means including a plurality of rows for storing words, each word having a given number of characters falling within a specified range, a plurality of columns, and address control means for effecting the shifting of characters through a row and also the shifting of a column itself; and

writing means coupled to said main memory means and to said processing memory means for writing the word data read out from said main memory means into said processing memory means, said writing means including:

word positioning code detecting means and control means associated therewith coupled to said address control means for shifting address data of said processing memory means via said address control means in the column direction responsive to each word data being read out of said main memory means, and for sequentially shifting characters in the word data and a word positioning code following the word data in the row direction;

specific column address designating means coupled to said address control means for, after a word data and subsequent word positioning code from said main memory means is stored in said processing memory means, designating via said address control means that specific row address position of the column where the word positioning code is stored;

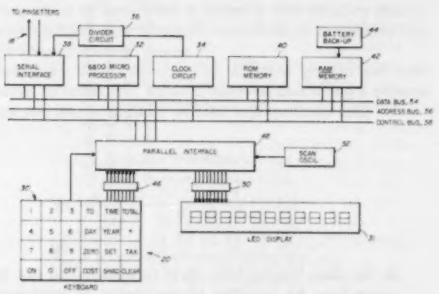
specific code writing means for effecting a write-in of said specific code in said specific row address position, said specific code being used to selectively detect a word data in a record data stored in said processing memory means; and

record positioning code-detecting means and control means associated therewith coupled to said address control means for enabling a plurality of word data in the record data to be continuously written, until a record positioning code is detected, and for then inhibiting writing of data.

4,133,042
AUTOMATIC PINSETTER CONTROLLER SYSTEM

Ben W. Wallace, 95 Walnut St., Brookline, Mass. 02146

Filed Dec. 19, 1977, Ser. No. 861,844
Int. Cl.[2] G06F *3/04, 5/04*
U.S. Cl. 364—900 9 Claims



1. An automatic pinsetter controller system for providing electrical and financial controls over the utilization of automatic pinsetting machines in a bowling alley comprising:

a digital data decoding means attached to each pinsetter in a bowling alley having means to receive parallel digital status data from its attached pinsetter, having means to transmit said digital status data to a computer; having means to receive serial digital status queries and commands for its attached pinsetter and having means to answer said queries and cause said pinsetter to okay said commands;

a two-wire serial data bus which sends and receives said serial digital data and commands to and from each of said digital data decoding devices to said central computer;

a central operator control computer console means which receives and records all said serial digital data from each of said decoding devices and which under program control transmits saids status queries and machine commands to each of said decoding devices for the control and operation of its individual pinsetter, all of said transmissions being over said serial data bus;

a keyboard data entry means on said computer console to permit operator commands and queries for data to be transmitted to said computer and to said pinsetters; and

a light emitting diode display means on said computer console to display to an operator his command and query entries and the responses thereto.

4,133,043
SHIFT REGISTER TYPE MEMORY

Minoru Hiroshima, Mobara; Shigeru Yoshizawa, Tokorozawa; Nobuo Saito, Mitaka; Atsushi Asano, Kokubunji; Hiroshi Suehiro, Yokohama; Minoru Saitoh, Kawasaki, and Keisuke Mise, Tokorozawa, all of Japan, assignors to Hitachi, Ltd. and Nippon Telegraph and Telephone Public Corporation, both of Japan

Filed Nov. 21, 1977, Ser. No. 853,276
Claims priority, application Japan, Dec. 3, 1976, 51-144757
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—15 11 Claims

1. A shift register type memory, comprising;

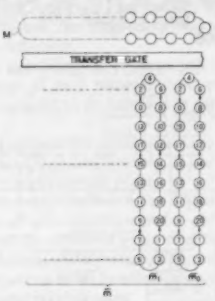
a plurality of minor loops each of which has a plurality of bits,

a major loop which is large enough to permit data of at least two blocks to simultaneously exist therein when data of one block from said minor loops are constructed of the same number of bits as the number of said minor loops,

means for controlling transfer of the data between said major loop and said minor loops,

means for generating first timing signals for transferring out a plurality of blocks into said major loop sequentially and

successively at time intervals shorter than a period of time required for the data to travel round said major loop, and means for generating a second timing signal for transferring



in the data having been already transferred out to said major loop by said first timing signal, to predetermined positions within said minor loops at a point of time between timings of the successive transfer-out operations.

4,133,044

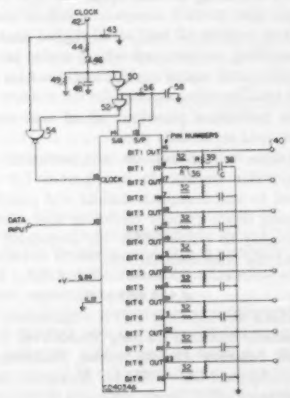
FAILURE-RESISTANT PSEUDO-NONVOLATILE MEMORY

Michael C. Gariazzo, Bowie, and Leonard S. Haynes, Columbia, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 28, 1978, Ser. No. 881,927

Int. Cl.[2] G11C *21/00*

U.S. Cl. 365—78 **3 Claims**



1. A multiple bit memory circuit comprising:

at least one shift register having a plurality of data bit line pairs, each pair having an input and an output, said shift register being selectably capable of operation in either synchronous or asynchronous modes and in either serial or parallel modes or any combination thereof;

means for selecting said modes of operation responsive to a pattern of clock pulses generated external to said memory circuit; and

clamping circuit means coupled to each of said data bit lines for storing data from said data bit lines during operation of said shift register in said serial/synchronous mode and for feeding back said data to said shift register during operation of said shift register in said parallel/asynchronous mode.

4,133,045

CYLINDRICAL DOMAIN MEMORY

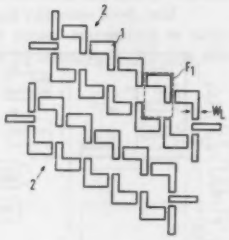
Burkhard Littwin, Hohenschäftlarn, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jul. 25, 1977, Ser. No. 818,443

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1976, 2637226

Int. Cl.[2] G11C *19/08*

U.S. Cl. 365—39 **3 Claims**



1. In a cylindrical domain memory of the type having a storage medium constructed in layer form including cylindrical domains which are magnetized at right angles to the plane of one layer, which magnetization is directed opposite to that of the adjacent area and to that of a magnetic bias field, a propagation structure comprising an overlay pattern of individual elements of magnetizable material in the form of layers carried on the one layer, and a rotary magnetic field parallel to the one layer for causing displacement of the cylindrical domains along a path determined by the propagation structure, the improvement wherein:

said individual elements of said propagation structure each include an L-shaped structure, each of said L-shaped structures comprising two legs, one of said legs having a width which is greater than that of the other of said legs, said elements staggered in stepped fashion relative to one another.

4,133,046

DEVICE FOR DISPLAYING A MEASURING VOLTAGE, FOR EXAMPLE AN EKG SIGNAL, ON THE VIEWING SCREEN OF AN OSCILLOGRAPH TUBE

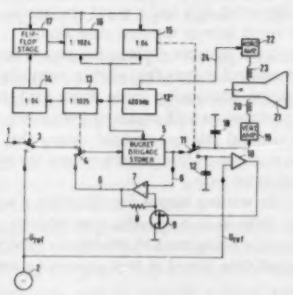
Bernd Kusserow, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Oct. 11, 1977, Ser. No. 840,809

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1976, 2650556

Int. Cl.[2] G11C *11/26*

U.S. Cl. 365—45 **12 Claims**



1. A device for displaying a measuring voltage on a viewing screen wherein the values of the measuring voltage arriving in chronological succession are stored in corresponding chrono-

logical sequence, and are read out in cyclical repetition, characterized in that a bucket brigade storer (5), capable of signal feedback from output to input with adjustable amplification, functions as an image repeating storer with the measured values of the measuring voltage being stored in analog fashion, a reference voltage means (2) being associated with the bucket brigade storer at its input side for supplying a reference voltage value thereto, and a voltage comparator (10) at its output side, the voltage comparator (10) being operable to compare the reference voltage value after it has passed through the bucket brigade storer with a reference voltage value (U_{ref}) of the reference voltage means, and, in the case of deviation in the two values, being operable to adjust the amplification of the bucket brigade storer such that substantially equal reference voltage values occur at the input and output of the bucket brigade storer.

4,133,047

SYSTEM FOR STORING AND RETRIEVING INFORMATION AT THE MOLECULAR LEVEL

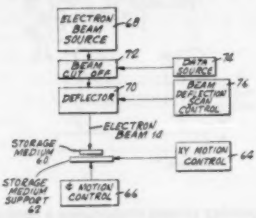
Cyrus Levinthal, 435 Riverside Dr., New York, N.Y. 10025

Filed Feb. 12, 1975, Ser. No. 549,450

The portion of the term of this patent subsequent to Jul. 5, 1994, has been disclaimed.

Int. Cl.[2] G11C *11/26*

U.S. Cl. 365—118 **10 Claims**



1. An information storage medium comprising:

a substantially continuous and regular lattice of bit storage units arranged side-by-side to form a layer, each unit being less than about 1000 Angstroms in size, and each unit comprising material modifiable when individually irradiated by a focused electron beam, wherein the modification of one unit does not substantially modify units adjacent thereto, each storage unit storing one binary bit of information; and

a support attached to the lattice and supporting the information bit storage units thereof.

4,133,048

INTEGRATED SEMICONDUCTOR DYNAMIC MEMORY

Palmir M. Gafarov, 103489, korpus 614, kv. 26; Jury V. Minkov, 103527, korpus 903, kv. 155, and Vladimir I. Solomonenko, 103489, korpus 710, kv. 73, all of Moscow, U.S.S.R.

Filed Sep. 22, 1977, Ser. No. 835,664

Claims priority, application U.S.S.R., Sep. 30, 1976, 2406945

Int. Cl.[2] G11C *7/06*

U.S. Cl. 365—208 **1 Claim**

1. An integrated semiconductor dynamic memory comprising:

a memory matrix containing

memory cells divided into two groups;

a plurality of select buses of said memory matrix located along a respective matrix line;

a plurality of first number buses of said memory matrix located along a respective matrix column;

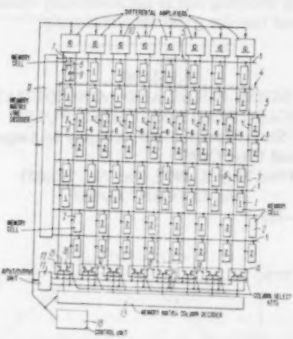
a plurality of second number buses of said memory matrix located along a respective matrix column parallel to said first number bus;

memory cells of a first group of memory cells having a first termminal connected to a respective select bus and a second terminal connected to a respective first number bus;

memory cells of a second group of memory cells having a first terminal connected to a respective select bus and a second terminal connected to a respective second number bus;

a plurality of differential amplifiers, the number of which being equal to that of the columns in said memory matrix, having information terminals connected to respective first and second number buses;

said memory cells belonging to different groups and connected to respective number buses so that along a column they are interspaced by at least one memory cell;



a memory matrix line decoder to which said memory matrix select buses are connected;

data input/output buses;

memory matrix column select keys connecting at least one of said number buses of a respective column to said data input/output buses;

a matrix column decoder having outputs connected to a control unit of said matrix column select keys;

a numeric data input/output unit having outputs connected to said data input/output buses;

a control unit having outputs connected to respective control inputs of said column differential amplifiers, of said matrix line decoder, of said matrix column decoder and of said numeric data input/output unit.

4,133,049

MEMORY CIRCUIT ARRANGEMENT UTILIZING ONE-TRANSISTOR-PER-BIT MEMORY CELLS

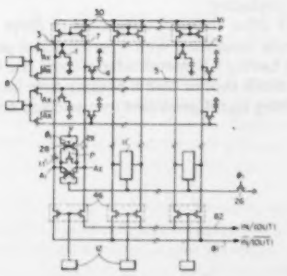
Hajime Shirato, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed May 18, 1977, Ser. No. 797,917

Claims priority, application Japan, May 21, 1976, 51-58945

Int. Cl.[2] G11C *11/40*

U.S. Cl. 365—208 **6 Claims**



1. A memory circuit arrangement comprising a pair of first

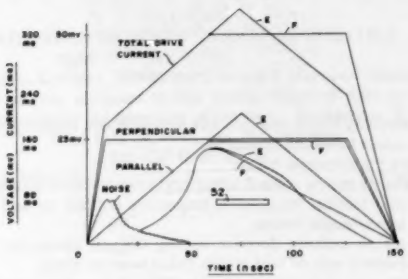
and second digit lines, first and second word lines intersecting with said pair of digit lines and forming cross-points therebetween, a first memory cell provided at the cross-point of said first digit line and said first word line and connected to said respective first lines, a second memory cell provided at the cross-point of said second digit line and said second word line and connected to said respective second lines, a sense amplifier, having terminals connected to said first and second digit lines for detecting the state of logic signals stored in said memory cells, first and second transfer gates coupled to said first and second word lines, respectively, said first transfer gate transferring an activation signal for activating said first word line and said second transfer gate transferring a signal complementary to said activation signal in polarity to said second word line, and selecting means for selectively controlling said first and second transfer gates simultaneously.

4,133,050

EARLY NOISE PULSE AND LONG DURATION, STABILIZED SWITCHING PULSE

Victor L. Sell, Santa Monica, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed May 2, 1977, Ser. No. 793,031
Int. Cl.[2] G11C *11/063*
U.S. Cl. 365—213 **29 Claims**



1. A magnetic core memory comprising:

an array of magnetic memory cores, each being switchable between two different states of magnetization in response to a current inductively coupled thereto;

a plurality of conductors inductively coupling the cores of the array, the conductors carrying switching signals induced thereon by a core switching from one stable state to another and currents for selective, coincident current switching of cores within the array, the conductors including at least one sense conductor extending through the array and having a core output switching signal inductively coupled thereto, a plurality of parallel drive conductors extending through the array in the same direction as the sense conductor, and a plurality of perpendicular conductors different from the sense conductor and extending through the array in a direction perpendicular to the sense conductor;

perpendicular drive circuitry connected to drive a selected perpendicular conductor with a partial select perpendicular current having a perpendicular current rise time interval that is much shorter than a peaking time interval for a core switching signal generated by a selected core switching from one stable state to another to reach a peak voltage amplitude; and

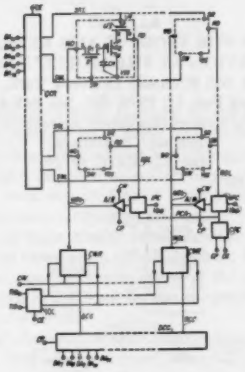
parallel drive circuitry connected to drive a selected parallel conductor with a partial select parallel current having a rise time interval that continues until at least approximately the peaking time.

4,133,051

INFORMATION REFRESHING SYSTEM IN A SEMICONDUCTOR MEMORY

Claudio Gentili, Cornaredo (Milan), Italy, assignor to Honeywell Information Systems Italia, Caluso, Italy

Filed Dec. 23, 1974, Ser. No. 535,267
Claims priority, application Italy, Dec. 27, 1973, 32159 A/73
Int. Cl.[2] G11C *13/00, 11/40*
U.S. Cl. 365—222 **1 Claim**



1. In a data processing system comprising a central processor interactive with a plurality of peripheral units and a main working semiconductor memory by means of interrupt requests sent by said peripheral units and by said working memory to said central processor, said interrupt requests having relative priority with respect to each other, said semiconductor memory including a plurality of memory cells arranged in a plurality of rows each row of which must be refreshed within a predetermined time interval after the last preceding refreshing operation; a refresh control system comprising: refresh control means, including addressing means, responsive to a refresh command received from said central processor to sequentially refresh said rows of memory cells, one row at each receipt of said refresh command, timing means for generating a sequence of pulses having a preestablished repetition rate, first circuit means responsive to said timing means for generating an interrupt request signal of low relative priority in synchronism with said repetition rate, said first circuit means including means for extinguishing said interrupt request signal upon the occurrence of a responsive refresh command, and second circuit means responsive to said timing means and to said first circuit means to generate an interrupt request signal of highest relative priority if a refresh command is not received by said first circuit means within a preestablished interval following the generation of an interrupt request signal of said low relative priority.

DESIGN PATENTS

GRANTED JAN. 2, 1979

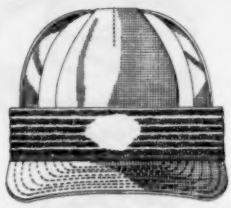
ERRATA

For CLASS	See PATENT NO.
D16-014	250,676
D87-005 F	250,732

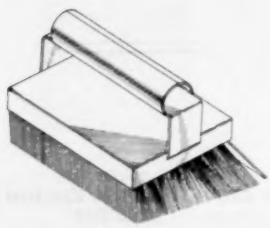
DESIGNS

JANUARY 2, 1979

250,676
SPORT CAP
Edward P. McKinsey, Jr., 304 Mill Rd., Oreland, Pa. 19075
Filed Jun. 2, 1977, Ser. No. 802,822
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—244

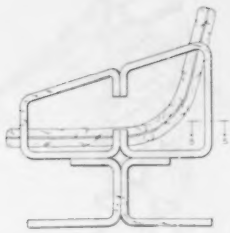


250,677
PAINT BRUSH
Francis L. Love, 7010 Reynoldsburg-New Albany Rd., New Albany, Ohio 43054
Filed May 27, 1977, Ser. No. 801,295
Term of patent 14 years
Int. Cl. D4—*04*
U.S. Cl. D4—38

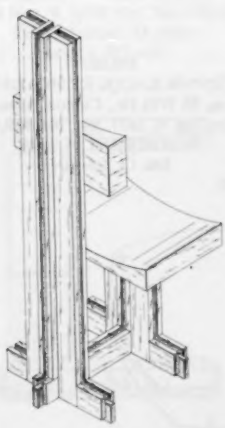


250,678
MICROFICHE READER
Peter J. Hall, 274 Burton Ave., Barrie, Ontario, Canada (L4N 2S2)
Filed Sep. 22, 1976, Ser. No. 725,652
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—14

250,679
CHAIR
Steven D. Gageby, 12 Hay Camp Rd., North Oaks, Minn. 55110
Filed Apr. 16, 1976, Ser. No. 677,627
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—67

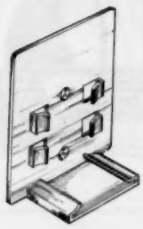


250,680
CHAIR
Steven D. Gageby, 12 Hay Camp Rd., North Oaks, Minn. 55110
Filed Apr. 16, 1976, Ser. No. 677,602
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—75

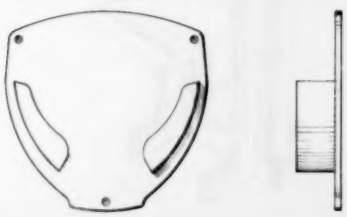


250,681
COMBINED HAMPER AND SHELVING UNIT
Sharad M. Mistry, 3029 N. Rampart St., New Orleans, La. 70117
Filed Oct. 7, 1976, Ser. No. 730,696
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—86

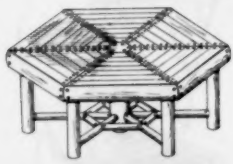
250,683
ELECTRIC BURNER STAND
John J. Vetere, Danvers, Mass.; Ronald E. Edin, New Durham, N.H., and Philip G. Aberizk, Methuen, Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.
Filed Sep. 14, 1977, Ser. No. 833,389
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—136



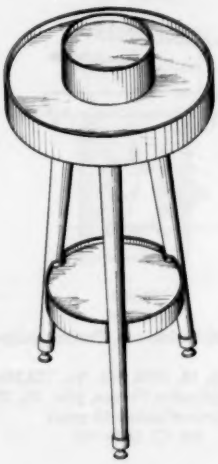
250,682
TENNIS RACQUET HOLDER
Charles G. Craven, 35 Will Dr., Canton, Mass. 02021
Filed Sep. 6, 1977, Ser. No. 830,905
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—125



250,684
TABLE
Lorraine A. Van Sant, 111 16th St. North, Wisconsin Rapids, Wis. 54494
Filed Apr. 4, 1977, Ser. No. 784,625
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—146

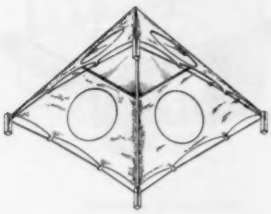


250,685
PLANT STAND
Charles J. Insalaco, Pigeon Swamp Rd., South Windham, Conn. 06266
Filed Oct. 14, 1977, Ser. No. 842,231
Term of patent 14 years
Int. Cl. D6—*06, 03*
U.S. Cl. D6—146

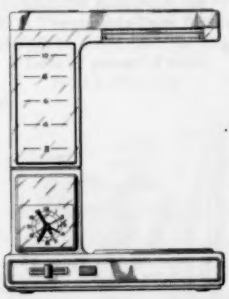


250,686
REVERSIBLE HOLDER FOR PLANT POTS, VASES OR THE LIKE
Frederick N. Ashcraft, 4627 Hercules Ave., Jacksonville, Fla. 32205
Filed Jun. 10, 1977, Ser. No. 805,622
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—183

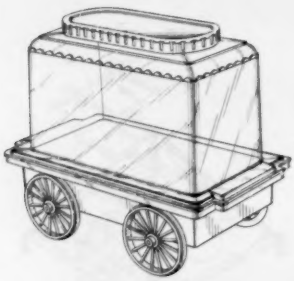
250,687
BED CANOPY
Jerome Robelen, 1522 San Miguel Ave., Spring Valley, Calif. 92077
Filed Nov. 26, 1975, Ser. No. 635,312
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—198



250,688
ELECTRIC COFFEEMAKER OR SIMILAR ARTICLE
Arthur M. Felske, Westport, and Max C. Hauenstein, Monroe, both of Conn., assignors to General Electric Company
Filed Nov. 8, 1976, Ser. No. 739,567
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—41

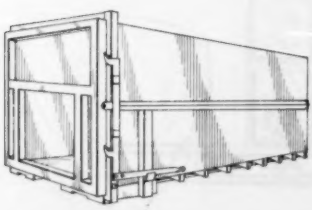


250,689
CORN POPPER
Ernest Lee, Park Ridge, and Robert O. Ernest, Oak Park, both of Ill., assignors to Sunbeam Corporation, Chicago, Ill.
Filed Jan. 17, 1977, Ser. No. 760,147
Term of patent 14 years
Int. Cl. D7—*02;* D15—*08*
U.S. Cl. D7—94

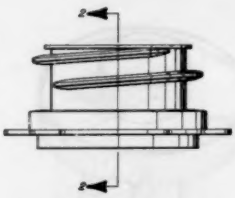


250,690
STAND FOR A GROUND COFFEE DISPENSER
Arthur M. Felske, Westport, Conn., assignor to General Electric Company
Filed Nov. 1, 1976, Ser. No. 737,859
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—130

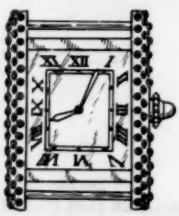
250,691
GARBAGE CONTAINER
Melvin V. Horpestad, 3420 River Rd., West Delta, British Columbia, Canada
Filed Oct. 12, 1976, Ser. No. 731,681
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—189



250,692
ADAPTER FOR A CONTAINER SPOUT
Curtis J. Bond, Marion, and John G. Ulm, Upper Sandusky, both of Ohio, assignors to Corco, Inc.
Filed Jan. 10, 1977, Ser. No. 758,332
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—253



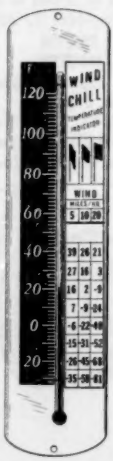
250,693
WATCH
Alain D. Perrin, Rueil-Malmaison, France, assignor to Cartier International B.V.
Filed Sep. 14, 1976, Ser. No. 723,166
Claims priority, application France, Mar. 15, 1976, 76 74640
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—39



250,694
WATCH
Alain D. Perrin, Rueil-Malmaison, France, assignor to Cartier International B.V.
Filed Sep. 14, 1976, Ser. No. 723,167
Claims priority, application France, Mar. 15, 1976, 76 74640
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—39

250,695
WATCH
Alain D. Perrin, Rueil-Malmaison, France, assignor to Cartier International B.V.
Filed Sep. 14, 1976, Ser. No. 723,168
Claims priority, application France, Mar. 15, 1976, 76 74640
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—39

250,696
THERMOMETER
George N. Kaniwec, Southington, Conn., assignor to The Cooper Thermometer Company
Filed Apr. 7, 1977, Ser. No. 785,349
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—58



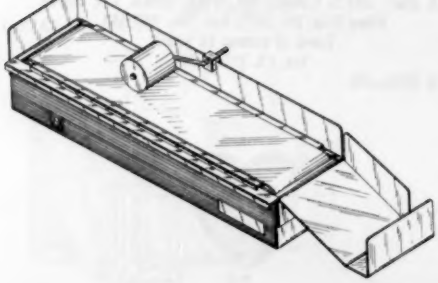
250,697
TIRE TREAD GAUGE
Bernard A. Jordan, 2733 Terrace View La., Wayzata, Minn. 55391
Filed Nov. 8, 1976, Ser. No. 739,463
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—70

250,698
WATCH CROWN
Alain D. Perrin, Rueil-Malmaison, France, assignor to Cartier International B.V.
Filed Sep. 14, 1976, Ser. No. 723,055
Claims priority, application France, Mar. 15, 1976, 76 74640
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—131

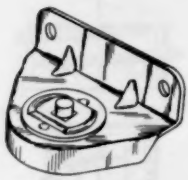
250,699
PENDANT OR SIMILAR ARTICLE
Josef J. Barr, 293 S. County Rd., Palm Beach, Fla. 33480
Filed Feb. 11, 1977, Ser. No. 767,843
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—56

250,700
SANTA CLAUS STOCKING
Marie W. Studdard, 4511 Timberhill, San Antonio, Tex. 78238
Filed Mar. 29, 1977, Ser. No. 782,537
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D11—126

250,701
ENVELOPE POWER STACKER
Edward A. Krupotich, Palo Alto, Calif., assignor to Omation Corporation, Palo Alto, Calif.
Filed Jan. 12, 1977, Ser. No. 758,661
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D12—58

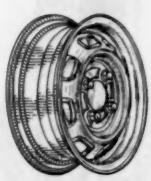


250,702
REARVIEW MIRROR SUPPORT BRACKET
Wayne VandenBrink, and Philip D. Stegenga, both of West Olive, Mich., assignors to Donnelly Mirrors, Inc., Holland, Mich.
Filed May 16, 1977, Ser. No. 797,605
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—187

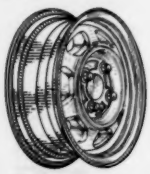


250,703
WHEEL
Hirotsune Taitani, Seto, and Shiro Ina, Nagoyo, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan
Filed Jun. 29, 1977, Ser. No. 811,369
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—209

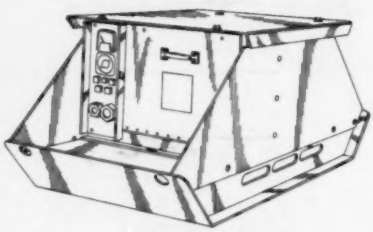
250,704
WHEEL
Hirotsune Taitani, Seto, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan
Filed Jun. 29, 1977, Ser. No. 811,367
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211



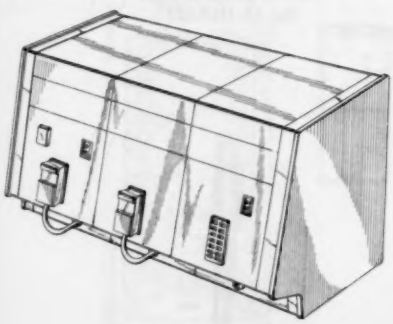
250,705
WHEEL
Sinichiro Doi, and Iwae Sekido, both of Nagoya, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan
Filed Jun. 29, 1977, Ser. No. 811,370
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211



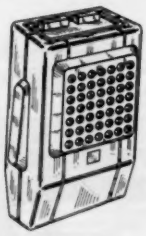
250,706
BATTERY CHARGER
Wolbert DeHaan, Bluefield, Va., assignor to A-T-O Inc., Willoughby, Ohio
Filed Jan. 19, 1977, Ser. No. 760,680
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D13—5

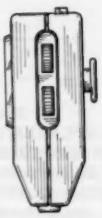


250,707
CONSOLE FOR CENTRAL DICTATION SYSTEM
Arthur J. Pulos, Fayetteville, and Paul B. Sweeney, Syracuse, both of N.Y., assignors to Dictaphone Corporation, Rye, N.Y.
Filed Jan. 3, 1977, Ser. No. 756,405
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—1

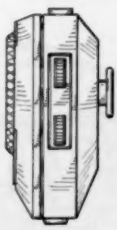


250,708
CITIZENS BAND MICROPHONE
Hiroshi Sakaguchi, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Apr. 15, 1977, Ser. No. 788,077
Claims priority, application Japan, Nov. 8, 1976, 51-44033
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—12

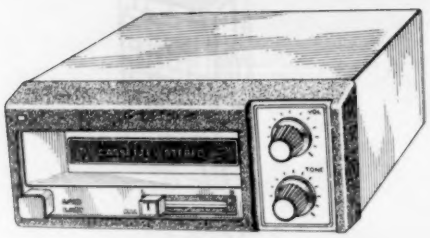




250,709
CITIZENS BAND MICROPHONE
Hiroshi Sakaguchi, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Apr. 15, 1977, Ser. No. 788,078
Claims priority, application Japan, Nov. 8, 1976, 51-44034
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—12

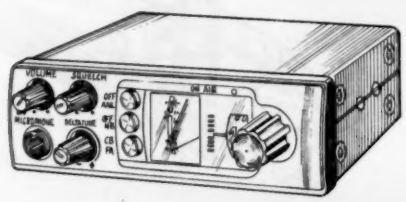


250,710
AUTOMOBILE TAPE PLAYER
Junji Yasuoka, Tottori, Japan, assignor to Sanyo Electric Co., Ltd., Moriguch, Japan
Filed Sep. 2, 1976, Ser. No. 719,898
Term of patent 3½ years
Int. Cl. D14—*01*
U.S. Cl. D14—7



250,711
LOUD-SPEAKER DEVICE FOR CARS
Per Persson, Radhusgatan 3, and Leo Koppelomaki, Almgatan 23, both of 330 23 Smalandsstenar, Sweden
Filed Aug. 23, 1976, Ser. No. 716,468
Claims priority, application Sweden, Feb. 23, 1976, 76416
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—33

250,712
TRANSCEIVER
Lawrence L. Yanitz, 6630 Red Cedar La., Union Lake, Mich. 48085
Filed Jun. 7, 1976, Ser. No. 693,322
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—68

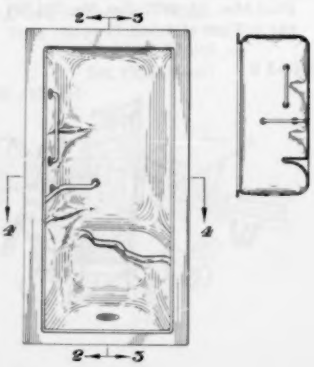


250,713
RIPPER SHIELD FOR CONSTRUCTION AND AGRICULTURAL MACHINERY
Jouko K. Korpi, Dalen, S-693 00 Degerfors, Sweden
Filed Apr. 20, 1977, Ser. No. 789,320
Claims priority, application Sweden, Oct. 28, 1976, 76-2090
Term of patent 14 years
Int. Cl. D15—*03, 04*
U.S. Cl. D15—28

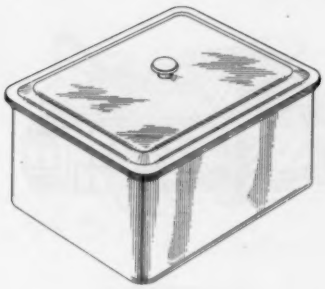
250,714
CULTIVATOR TINE
Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland
Filed Feb. 3, 1977, Ser. No. 765,389
Claims priority, application Benelux, Aug. 13, 1976, 5122300
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—29

250,715
DOCUMENT HOLDER
Norman Hedstrom, Worcester; David M. Wright, and Jerome O'Toole, both of Shrewsbury, all of Mass., assignors to Wright Line Inc., Worcester, Mass.
Filed Nov. 12, 1976, Ser. No. 741,225
Term of patent 14 years
Int. Cl. D19—*04*
U.S. Cl. D19—91

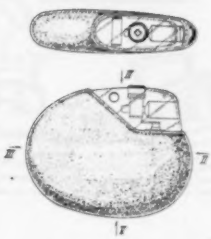
250,716
SHOWER STALL FOR HANDICAPPED PERSONS
Lee A. Smith, 3901 Foxcroft Rd., Charlotte, N.C. 28211
Filed Jul. 6, 1977, Ser. No. 813,414
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—57



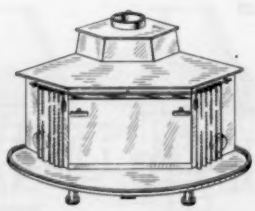
250,717
SINK
Nicolas Rodriguez, 82 NE. 68th Terrace, Miami, Fla. 33138
Filed Aug. 11, 1976, Ser. No. 713,126
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—58



250,718
FIREPLACE STOVE
Milton G. Koster, 11965 SE. 352nd Ave., Boring, Oreg. 97009
Filed Aug. 26, 1977, Ser. No. 828,245
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97

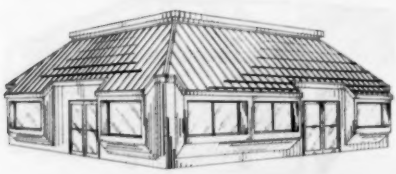


250,719
HEART PACER
Peter Jacobson, and Robert Norman, both of Indiana, Pa., assignors to Coratomic, Inc., Indiana, Pa.
Filed Oct. 11, 1977, Ser. No. 843,163
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—17

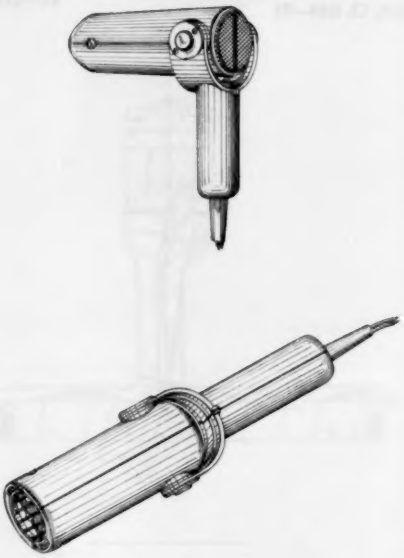


250,720
FAST SERVICE RESTAURANT BUILDING
D. Pat Fraley, Richardson, Tex., assignor to Church's Fried Chicken, Inc., San Antonio, Tex.
Filed May 9, 1977, Ser. No. 794,751
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—25

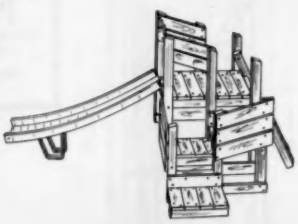
250,721
FAST SERVICE RESTAURANT BUILDING
D. Pat Fraley, Richardson, Tex., assignor to Church's Fried Chicken, Inc., San Antonio, Tex.
Filed May 9, 1977, Ser. No. 794,753
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—25



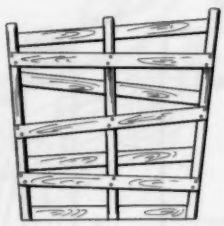
250,722
PORTABLE HAIR DRYER
Morison S. Cousins, and Michael A. Cousins, both of New York, N.Y., assignors to The Gillette Company, Boston, Mass.
Filed Sep. 12, 1977, Ser. No. 832,537
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—16



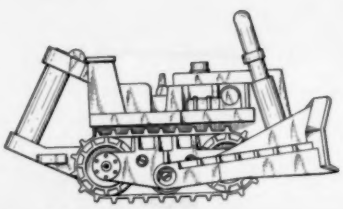
250,723
PLAYGROUND SLIDE
Berthold B. Dieter, and Charles L. Gibson, both of Terre Haute, Ind., assignors to Creative Playgrounds Corporation, Terre Haute, Ind.
Filed Mar. 24, 1977, Ser. No. 780,865
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 E



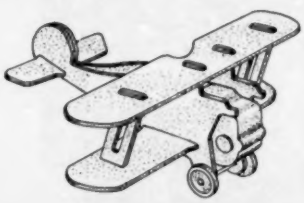
250,724
PLAYGROUND UNIT
Berthold B. Dieter, and Charles L. Gibson, both of Terre Haute, Ind., assignors to Creative Playgrounds Corporation, Terre Haute, Ind.
Filed May 2, 1977, Ser. No. 792,674
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 L



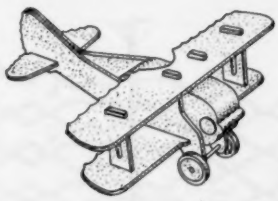
250,725
TOY BULLDOZER
Jack L. Breneman, Orchard Park, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Oct. 29, 1976, Ser. No. 737,175
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AM



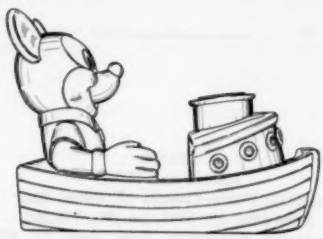
250,726
TOY AIRPLANE
Arthur P. Venditti, Peabody, Mass., assignor to General Mills Fun Group, Inc., Minneapolis, Minn.
Filed Nov. 12, 1976, Ser. No. 741,182
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 HH



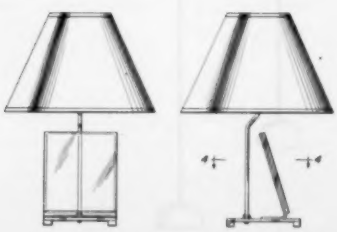
250,727
TOY AIRPLANE
Arthur P. Venditti, Peabody, Mass., assignor to General Mills Fun Group, Inc., Minneapolis, Minn.
Filed Nov. 12, 1976, Ser. No. 741,329
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 HH



250,728
TOY BOAT
Michael I. Satten, Great Neck Estates, N.Y., assignor to Child Guidance Playthings, Inc., New York, N.Y.
Filed Jan. 19, 1977, Ser. No. 760,630
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 JJ

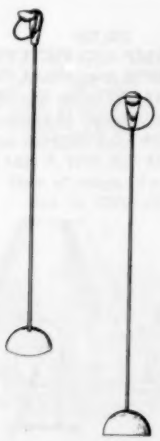


250,729
COMBINED LAMP AND PICTURE FRAME
Jose Konski, 506 NW. 107th Ave., Miami, Fla. 33168
Filed Feb. 14, 1977, Ser. No. 768,713
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 D

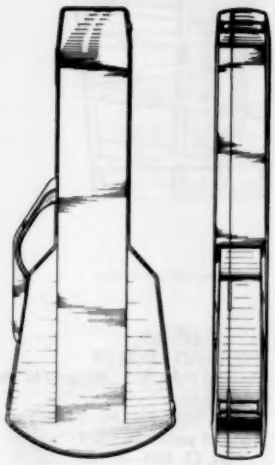


250,730
LIGHT FIXTURE
Tobia Scarpa, Via Campagna 3, Trevigano, Italy
Filed Mar. 17, 1977, Ser. No. 778,552
Claims priority, application Italy, Sep. 17, 1976, 7039 B/76[U]
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 A

250,731
LIGHT FIXTURE
Achille Castiglioni, Piazza Castello 27, Milan, Italy
Filed Mar. 17, 1977, Ser. No. 778,555
Claims priority, application Italy, Sep. 17, 1976, 7040 B/76[U]
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 A

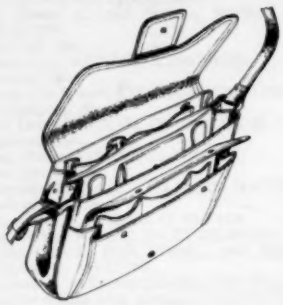


250,732
CARRYING CASE FOR A MUSICAL INSTRUMENT OR SIMILAR ARTICLE
Willfred Goldschmidt, Greenwich, Conn., assignor to Norlin Music, Inc., Lincolnwood, Ill.
Filed Feb. 18, 1976, Ser. No. 658,917
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—5 F

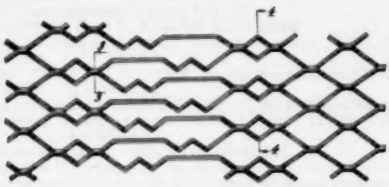


250,733
NONWOVEN SHEET MATERIAL OR THE LIKE
Donald T. Appleman, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Continuation-in-part of Ser. No. 731,072, Oct. 8, 1976. This application Mar. 2, 1977, Ser. No. 773,724
Term of patent 14 years
Int. Cl. D5—*06*
U.S. Cl. D59—2 B

250,734
HANDBAG
Milton I. Siegel, Scottsdale, Ariz., assignor to Amba Marketing Systems, Inc.
Filed Mar. 28, 1977, Ser. No. 781,627
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—3 F



250,735
EXPANDED METAL PANEL
Orlando A. Jonnum, 12247 Dolan, Downey, Calif. 90242
Filed Jun. 10, 1977, Ser. No. 805,623
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D92—26



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 2ND DAY OF JANUARY, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. E. Lenton (Wisbech) Limited: *See—*
Gent, Ernest C.; and Watson, Stephen R., 4,132,304, Cl. 198-432.000.

A. Lassiere Ltd.: *See—*
Lassiere, Alan, 4,132,428, Cl. 280-278.000.

A/S Nycotron: *See—*
Kolberg, Ole-Robert, 4,132,644, Cl. 210-85.000.

A. Stucki Company: *See—*
Wiebe, Donald, 4,132,176, Cl. 105-197.0DH.

AB Medipharm: *See—*
Kvanta, Endre, 4,132,597, Cl. 195-96.000.

AB Volvo: *See—*
Janiszewski, Gregor K., 4,132,125, Cl. 74-477.000.

Abbott Laboratories: *See—*
Bujan, Albert F., 4,132,135, Cl. 81-3.46A.
Danks, Barbara A., 4,132,334, Cl. 222-490.000.
Tomioka, Shinji; Mori, Yasuki; and Shirahata, Kunikatsu, 4,132,846, Cl. 536-17.000.

Abell, Clarence L., to Boeing Company, The. Wing pivot location and structure for oblique wing airplane. 4,132,374, Cl. 244-46.000.

Abramson, Joseph O. Crimping apparatus. 4,132,101, Cl. 72-324.000.

Absher, John W. Hand tool. 4,131,994, Cl. 30-148.000.

Access Control Systems Pty. Ltd.: *See—*
Millar, Frederick W., 4,132,439, Cl. 292-144.000.

Ace Furnaces Limited: *See—*
Johnson, Keith; and Hipkin, Frank, 4,132,394, Cl. 266-138.000.

Ace Service Incorporated: *See—*
Smith, Donald D.; Davis, Otis L., III; and Heiniger, Richard, 4,132,181, Cl. 111-7.000.

ACF Industries, Inc.: *See—*
Van Dyke, Ronald D.; Hammonds, James C.; and Stoller, Patricia S., 4,132,327, Cl. 220-244.000.
Winkley, Jerry H., 4,132,751, Cl. 261-39.00B.

Acme Conveyor Company: *See—*
Mastak, Ned J., 4,132,305, Cl. 198-432.000.

Acushnet Company: *See—*
Hottel, Hoyt C., Jr.; Brown, Robert A.; Moore, Randall W.; and Sullivan, Paul F., 4,132,462, Cl. 350-117.000.

Adams, Maurice L., Jr., to Westinghouse Electric Corp. Rotating element fluid seal for centrifugal compressor. 4,132,416, Cl. 277-18.000.

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Addis, John L.; and Hofer, Bruce E., to Tektronix, Inc. Feedbeside correction circuit for an amplifier. 4,132,958, Cl. 330-252.000.

Advanced Mineral Research AB: *See—*
Kihlstedt, Per G.; and Hassler, Hedvig E. B., 4,132,559, Cl. 106-117.000.

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Debard, Andre, 4,132,333, Cl. 222-402.130.

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Rossbach, Horst, 4,133,010, Cl. 360-68.000.
Wetzel, Gunter, 4,132,476, Cl. 355-3.0DD.

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Pollet, Robert J.; Thiers, Robrecht J.; Ghys, Theofiel H.; Vandenberghe, Antoon L.; Philippaerts, Herman A.; and Vandenabeele, Hubert, 4,132,551, Cl. 96-66.500.
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Aidlin, Stephen H.: *See—*
Aidlin, Samuel S.; and Aidlin, Stephen H., 4,132,584, Cl. 156-500.000.

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Nichols, John A., 4,132,011, Cl. 34-86.000.

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Terada, Takami, 4,132,447, Cl. 297-367.000.

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Nomura, Hiroaki; Hitaka, Takenori; Akimoto, Hiroshi; Minami, Isao; Kiriki, Fumio; Matsuda, Tatsuichi; and Fugono, Takeshi, 4,132,789, Cl. 424-246.000.

Akiyama, Satoshi; and Shikutani, Michio, to Kabushiki Kaisha Shikutani. Blowing apparatus. 4,132,507, Cl. 417-234.000.

Albert, Eugene V., to Q Corporation. Apparatus for trimming electrical component leads. 4,132,137, Cl. 83-404.000.

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Garcea, Gianpaolo, 4,132,070, Cl. 60-290.000.

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Eernstman, Tjeerd; Auger, Christopher J.; and Devroede, Emile M., 4,132,690, Cl. 260-23.0AR.
Long, E. David, 4,132,210, Cl. 123-179.00L.

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Ballendux, Gerardus M., 4,132,133, Cl. 74-745.000.
Jones, Kenneth R.; and Schaefer, Daniel W., 4,132,280, Cl. 180-19.00H.

Alphatron Incorporated: *See—*
Brown, William T.; Moran, Robert J.; and LeBlanc, Larry M., 4,132,250, Cl. 140-115.000.

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Morel, Paul; Dugois, Jean-Pierre; and Langon, Bernard, 4,132,621, Cl. 204-243.00M.

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Blichare, Mitchell S.; and Jackson, Gerald J., Jr., 4,132,753, Cl. 264-25.000.
Conrow, Ransom B.; and Bernstein, Seymour, 4,132,730, Cl. 260-506.000.
Conrow, Ransom B.; and Bernstein, Seymour, 4,132,850, Cl. 544-196.000.
Coville, Michael W. C., 4,132,844, Cl. 528-499.000.
Durr, Frederick E.; and Damiani, Martin R., 4,132,797, Cl. 424-270.000.
Hertz, Martin R.; and Martin, John H. E. J., 4,132,779, Cl. 424-122.000.

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Wise, Henry; and Wood, Bernard, 4,132,672, Cl. 252-466.00B.

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Amigues, Pierre; Gaillard, Jean; Le Page, Jean-Francois; and Stern, Robert, to Institut Francais du Petrole. Process for isomerizing 1-butene to 2-butene. 4,132,745, Cl. 260-683.200.

AMP Incorporated: *See—*
Bruni, Aldo; and Campari, Luigi, 4,132,874, Cl. 200-16.00F.
Folk, Kenneth F.; and Shatto, Walter C., Jr., 4,132,251, Cl. 140-147.000.
Porta, Gary D., 4,132,460, Cl. 339-119.00R.
Rose, William H.; and Granitz, Richard F., 4,131,982, Cl. 29-566.200.
Shatto, Walter C., Jr., 4,132,252, Cl. 140-147.000.

Ampex Corporation: *See—*
Sell, Victor L., 4,133,050, Cl. 365-213.000.

Amuchastegui, Francisco, to Ziger, S.A. Cartridge case assembly. 4,132,173, Cl. 102-44.000.

Anchor Post Products, Inc.: *See—*
Pfarr, Walter L., Jr., 4,132,390, Cl. 256-24.000.

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Ando, Takeki: *See—*
Terunuma, Mutsuhiro; Shima, Seiya; Tashiro, Korefumi; Ando, Takeki; Inaba, Hiromi; Kurosawa, Toshiaki; and Kuroha, Hiroaki, 4,133,018, Cl. 361-87.000.

Andoniev, Sergei M.; Gritsuk, Lev D.; Gorbik, Anatoly S.; Kurganov, Viktor V.; Oleinik, Nikolai P.; Rivlin, Grigory I.; Stetsenko, Nikolai V.; Shamil, Jury P.; Smetanin, Jury G.; and Nesterenko, Petr S. Cooled roof of electric furnace. 4,132,852, Cl. 13-32.000.

Aono, Shigeo: *See—*
Asano, Masaharu; Aono, Shigeo; Hosaka, Akio; Ochiai, Kokichi; and Yamane, Michiyoshi, 4,132,200, Cl. 123-119.0EC.

Arai, Akihiro: *See—*
Urano, Fumio; Arai, Akihiro; Kobayashi, Takumi; and Umetsu, Junji, 4,132,472, Cl. 354-155.000.

Araki, Masatada: *See—*
Saito, Shinroku; Sawaoka, Akira; and Araki, Masatada, 4,132,554, Cl. 106-55.000.

Arcamone, Federico: *See—*
Bernardi, Luigi; Giardino, Pietro; Patelli, Bianca; and Arcamone, Federico, 4,132,721, Cl. 260-365.000.

Arcos Saldatura Elettrica Autogena S.p.A.: *See—*
Bove, Ottavio; and Cannata, Ugo, 4,132,338, Cl. 228-27.000.

Arendt, Georgy A.; Pokrovsky, Vladimir V.; Burov, Boris A.; Lipovich, Alexandr L.; Romanov, Evgeny I.; Vainshtein, Galina L.; and Khaitovich, Tsalel S., to Spetsialnoe Konstruktorskoe Bjuro Gazstroimashina. Pipe laying crane. 4,132,317, Cl. 212-49.000.

Arens, Wayne E.: *See—*
United States of America, National Aeronautics and Space Administration; and Arens, Wayne E., 4,132,989, Cl. 343-5.0CM.

Arneklev, Duane R.; Baker, Don R.; and Walker, Francis H., to Stauffer Chemical Company. N-(1,1-substituted propynyl)-α(3,5-substituted phenoxy) alkyl amides and their use as herbicides. 4,132,544, Cl. 71-118.000.

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Green, Terrence A., 4,132,437, Cl. 285-263.000.

Asahi-Dow Limited: *See—*
Izawa, Shinichi; Ohzeki, Jurou; Yahata, Tsuyoshi; and Nakanishi, Atsuo, 4,132,684, Cl. 260-4.0AR.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Ogawa, Shinsaku, 4,132,588, Cl. 159-47.00R.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Doi, Yuzuru; Kawahara, Masanao; and Tejima, Yasuyuki, 4,132,036, Cl. 51-124.00L.
Urano, Fumio; Arai, Akihiro; Kobayashi, Takumi; and Umetsu, Junji, 4,132,472, Cl. 354-155.000.

Asami, Shunichi: *See—*
Seita, Toru; Takahashi, Kenji; Asami, Shunichi; and Shimizu, Akihiko, 4,132,682, Cl. 521-27.000.

Asano, Atsushi: *See—*
Hiroshima, Minoru; Yoshizawa, Shigeru; Saito, Nobuo; Asano, Atsushi; Suehiro, Hiroshi; Saitoh, Minoru; and Mise, Keisuke, 4,133,043, Cl. 365-15.000.

Asano, Masaharu; Aono, Shigeo; Hosaka, Akio; Ochiai, Kokichi; and Yamane, Michiyoshi, to Nissan Motor Company, Limited. Emission control apparatus with reduced hangover time to switch from open- to closed-loop control modes. 4,132,200, Cl. 123-119.0EC.

Asano, Masaharu: *See—*
Takase, Sadao; Asano, Masaharu; and Nagai, Tadashi, 4,132,193, Cl. 123-32.0EE.

Asbeck, Adolf: *See—*
Heyden, Rudi; Asbeck, Adolf; Eckelt, Michael; and Gress, Wolfgang, 4,132,694, Cl. 260-29.60R.

Asher, Nathan F. Balanced swivel exercising device. 4,132,405, Cl. 272-146.000.

Ashley, Eugene, to General Electric Company. Liquid propellant weapon system. 4,132,149, Cl. 89-1.704.

Aso, Tetsuo: *See—*
Watanabe, Tsutomu; and Aso, Tetsuo, 4,132,747, Cl. 260-857.0PE.

Atlantic Richfield Company: *See—*
DeVries, Donald L.; and DeJovine, James M., 4,132,656, Cl. 252-30.000.

Atlas Copco Aktiebolag: *See—*
Ryd, Per-Olof, 4,132,361, Cl. 239-417.500.

Auger, Christopher J.: *See—*
Eernstman, Tjeerd; Auger, Christopher J.; and Devroede, Emile M., 4,132,690, Cl. 260-23.0AR.

Austin, George W., Jr.; Breton, Robert A.; Nolan, James J.; and Striebel, Edmund E., to United Technologies Corporation. Combustor liner for gas turbine engine. 4,132,066, Cl. 60-39.650.

Austin, Lowell W.: *See—*
Bush, Glenn W.; and Austin, Lowell W., 4,132,609, Cl. 204-28.000.

Avery, Bennett W.; Herr, Charles H., Jr.; and Lamport, Ivan R., to Caterpillar Tractor Co. Vehicle final drive assembly. 4,132,134, Cl. 74-801.000.

Avon Products, Inc.: *See—*
Doremus, John F., 4,132,521, Cl. 425-383.000.

Aya, Masahiro; Saito, Junichi; Kume, Toyohiko; and Yasui, Kazuomi, to Bayer Aktiengesellschaft. Organic(thio) phosphoric acid ester compounds and herbicidal compositions. 4,132,542, Cl. 71-86.000.

Aya, Masahiro; Fukazawa, Nobuo; Kurihara, Kazuo; and Kobori, Itsuro, to Bayer Aktiengesellschaft. Promoting selective growth of rice in paddies. 4,132,543, Cl. 71-88.000.

Ayerst, McKenna and Harrison, Ltd.: *See—*
Gauthier, Jean A.; Humber, Leslie G.; and Revesz, Clara, 4,132,710, Cl. 546-63.000.
Santroch, George; and Humber, Leslie G., 4,132,709, Cl. 546-89.000.

Ayres, Barry E., to Glaxo Laboratories Limited. Process for the preparation of 3-hydroxymethyl cephalosporins. 4,132,849, Cl. 544-28.000.

Aziende Chimiche Riunite Angelini Francesco A.S.R.A.F. S.p.A.: *See—*
Silvestrini, 4,132,791, Cl. 424-250.000.

Azzara, Anthony A., to Bruning Brothers Company, Inc. Means for engaging a slider automatically on a slide fastener chain. 4,131,993, Cl. 29-768.000.

B. Braun Melsungen Aktiengesellschaft: *See—*
Kirsch, Ulrich; and Krull, Manfred, 4,132,650, Cl. 210-491.000.

B. F. Goodrich Company, The: *See—*
Smith, Philip A., 4,132,291, Cl. 188-73.600.

Baizer, Manuel M.; Goodin, Richard D.; and Hallcher, Richard C., to Monsanto Company. Addition of organic electrophiles to carbon acids via catalysis by electrogenerated bases. 4,132,611, Cl. 204-59.00R.

Baker, Don R.: *See—*
Arneklev, Duane R.; Baker, Don R.; and Walker, Francis H., 4,132,544, Cl. 71-118.000.

Baker, John R.: *See—*
Cournoyer, George R.; Woody, Robert E.; and Baker, John R., 4,132,320, Cl. 214-6.00H.

Baker Perkins Inc.: *See—*
Cournoyer, George R.; Woody, Robert E.; and Baker, John R., 4,132,320, Cl. 214-6.00H.

Balaban, Alvin R.; and Steckler, Steven A., to RCA Corporation. Gating signal generator for switched pincushion correction circuit. 4,132,927, Cl. 315-371.000.

Baliga, B. Jayant, to General Electric Company. Electric field-controlled semiconductor device. 4,132,996, Cl. 357-21.000.

Ballendux, Gerardus M., to Allis-Chalmers Corporation. Auxiliary transmission. 4,132,133, Cl. 74-745.000.

Bank, Herman; and Cleland, Edward L., to United States of America, National Aeronautics and Space Administration. Gas diffusion liquid storage bag and method of use for storing blood. 4,132,594, Cl. 195-1.800.

Bannister, Richard N.; and Hardwick, Frank, to British Steel Corporation (Chemicals) Ltd. Phenol formaldehyde resins, their manufacture and use. 4,132,699, Cl. 260-38.000.

Bantle, Manfred, to Dr. Ing. h.c.F. Porsche AG, Firma. Wheel suspension arrangement for motor vehicles. 4,132,430, Cl. 280-673.000.

Barcz, James P.; Bigelow, James H.; Jaeschke, James R.; Piber, Earl T.; and Spellman, Gordon B., to Cutler-Hammer, Inc. Electromechanical chopper for speed control of battery powered devices. 4,132,933, Cl. 318-346.000.

Barcza, Sandor, to Sandoz, Inc. Substituted 3,1-benzazasilin-4-ones. 4,132,725, Cl. 260-448.20N.

Barfoed, Sven: *See—*
Larsen, Hans-Ole; Barfoed, Sven; and Gent, John A. G., 4,132,683, Cl. 521-106.000.

Barie, Walter P., Jr.; and Franke, Norman W., to Gulf Research & Development Company. Polyepoxy resin-diaryl dianhydride laminating resins and laminates. 4,132,697, Cl. 260-32.8EP.

Barrable, Victor E., to Cape Boards & Panels Ltd. Building board. 4,132,555, Cl. 106-90.000.

Bart, Hansueli, to Eaton Corporation. Metering valve for fuel injection. 4,132,201, Cl. 123-139.00E.

Barth, Jordan, to Colgate Palmolive Company. Oral product. 4,132,770, Cl. 424-49.000.

Barth, Jordan B.; and Costello, Christopher H., to Colgate Palmolive Company. Dentifrice. 4,132,772, Cl. 424-52.000.

Bartlett, Peter J.; and Taylor, Herbert D. B., to Lucas Industries Limited. Separating device. 4,132,646, Cl. 210-114.000.

Barza, Michael J.: *See—*
United States of America, National Aeronautics and Space Administration; Picciolo, Grace L.; Chappelle, Emmett W.; Deming, Jody W.; Shrock, Christian G.; Vellend, Hillar; Barza, Michael J.; and Weinstein, Louis, 4,132,599, Cl. 195-103.50K.

BASF Aktiengesellschaft: *See—*
Kittler, Wolfram; and Rotter, Gerhard, 4,133,009, Cl. 360-9.000.
Koplin, Eckhard; Hoffmann, Horst; Raiff, Siegfried; Richter, Peter; and Kaufmann, Helmut, 4,132,235, Cl. 134-99.000.

Bauer Bros. Co., The: *See—*
Engall, Fred, 4,132,366, Cl. 241-245.000.

Bauer, Russell E. Armored car window and windshield. 4,132,446, Cl. 296-155.000.

Baumann, Gerhard; Tanner, Hans; and Wuchner, Xaver, to Georg Fischer Aktiengesellschaft. Die head with workpiece actuated release. 4,132,495, Cl. 408-74.000.

Baxter Travenol Laboratories, Inc.: *See—*
Khoja, Mirza A.; Gutierrez, Louis F.; and Perone, John T., 4,132,349, Cl. 233-25.000.

Bayer Aktiengesellschaft: *See—*
Aya, Masahiro; Saito, Junichi; Kume, Toyohiko; and Yasui, Kazuomi, 4,132,542, Cl. 71-86.000.

Aya, Masahiro; Fukazawa, Nobuo; Kurihara, Kazuo; and Kobori, Itsuro, 4,132,543, Cl. 71-88.000.
Bunke, Klaus, 4,132,502, Cl. 416-70.00R.
Cramm, Gunther; Kranz, Eckart; and Hellrung, Gunter, 4,132,736, Cl. 260-552.0SC.
Hugl, Herbert; and Wolfrum, Gerhard, 4,132,840, Cl. 521-167.000.
Kreuer, Karl D.; and Schulte, Klaus, 4,132,838, Cl. 521-50.000.
Schafer, Rolf, 4,132,759, Cl. 423-161.000.

BBC, Aktiengesellschaft Brown, Boveri & Cie: *See*—
Hausler, Michael, 4,133,026, Cl. 363-49.000.

BBC Brown, Boveri & Company Limited: *See*—
Kullendorff, Anders, 4,132,343, Cl. 228-168.000.
Weiss, Gerhard, 4,132,076, Cl. 60-646.000.

Bean, Samuel. Method for suppressing herpes simplex virus. 4,132,782, Cl. 424-195.000.

Beauchemin, Edward: *See*—
Huettner, Robert E.; Grandmaison, John P.; Vernon, John H.; Lemay, Richard A.; and Beauchemin, Edward, 4,133,030, Cl. 364-200.000.

Becker, Charles H., to TRW Inc. Free spinning washer-nut assembly. 4,132,145, Cl. 85-32.00R.

Beech Aircraft Corporation: *See*—
Gay, Leon L.; Hardy, Periam B.; and Hutchinson, Donald, 4,132,169, Cl. 102-6.000.
Hardy, Periam B.; Gay, Lewis L.; and Husler, Edward L., 4,132,170, Cl. 102-6.000.

Beecham Group Limited: *See*—
Howarth, Thomas T.; Stirling, Irene; and Corbett, David F., 4,132,712, Cl. 260-307.0FA.

Beggs, George. Expandable vehicle. 4,132,444, Cl. 296-26.000.

Behmel, Klaus; Schmut, Wolfgang; and Zuckert, Bertram, to Vianova Kunstharz, A.G. Nonionically/cationically stabilized aqueous emulsions and process therefor. 4,132,687, Cl. 260-22.00A.

Bell & Howell Company: *See*—
Morrison, Wilbur J.; and Tress, Norwood E., 4,132,402, Cl. 271-263.000.

Bell Telephone Laboratories, Incorporated: *See*—
Chandross, Edwin A.; and Freed, Donald J., 4,132,608, Cl. 204-27.000.
Davis, Paul C., 4,132,907, Cl. 307-255.000.
Hilberman, Dan, 4,132,966, Cl. 333-80.00R.
Liu, Chao Kai, 4,132,870, Cl. 179-81.00R.
Smith, Douglas C., 4,132,863, Cl. 179-16.00F.

Ben Gurion University of the Negev: *See*—
Igra, Ozer, 4,132,499, Cl. 415-2.000.

Benden, Robert S.; and Parzuchowski, Richard S., to United Technologies Corporation. Gas phase deposition of aluminum using a complex aluminum halide of an alkali metal or an alkaline earth metal as an activator. 4,132,816, Cl. 427-237.000.

Bendix Corporation, The: *See*—
Elpern, David G.; and Casey, Gary L., 4,132,203, Cl. 123-139.0AW.
Ewald, Jerome T., 4,132,073, Cl. 60-562.000.
Fulmer, Keith H., 4,132,127, Cl. 74-512.000.
Orme, Myrl E., 4,132,973, Cl. 340-3.00T.

Benemann, Annelie; Schult, Norbert; Voj, Peter; and Hosemann, Bernhard, to Interatom, Internationale Atomreaktorbau GmbH. Device for producing conditions in a flowing medium, especially in a nuclear reactor, permitting measurement of a representative temperature. 4,132,115, Cl. 73-349.000.

Bengtsson, Sigurd W. Buckle. 4,131,976, Cl. 24-196.000.

Bennett, Christopher J. Vacuum panel. 4,132,218, Cl. 126-270.000.

Bennett, Dillard A. Down draft scrubber apparatus. 4,132,537, Cl. 55-226.000.

Bentz, Allan J., to Simmonds Precision Products, Inc. Apparatus for monitoring electrical properties of a liquid. 4,132,944, Cl. 324-30.00R.

Berendt, Hans-Ulrich: *See*—
Berger, Alfred; and Berendt, Hans-Ulrich, 4,132,525, Cl. 8-173.000.

Berenschot, Donald J.; Anders, Dale F.; and Hawker, Fred D., to DeSota, Inc. Aqueous dispersion thermosetting coating compositions based on aqueous emulsion copolymers containing two sources of hydroxy functionality. 4,132,688, Cl. 260-22.0CB.

Berg, Albert T., Jr.; and Langlie, Howard. Coupling unit for connecting poles in an end-to-end relationship. 4,132,489, Cl. 403-305.000.

Berg, John W. Auxiliary power system and apparatus. 4,132,384, Cl. 251-129.000.

Berger, Alfred; and Berendt, Hans-Ulrich, to Ciba-Geigy Corporation. Process for dyeing materials which contain synthetic fibres using polyadducts of propylene oxide and polyhydric alcohols. 4,132,525, Cl. 8-173.000.

Bergman, John E., to Blair Tool & Machine Corporation. Method and apparatus for mounting bristles on brush backs. 4,132,449, Cl. 300-4.000.

Bergman, Richard C., to Calspan Corporation. Gaseous discharge stabilization apparatus and method. 4,132,961, Cl. 331-94.5PE.

Berlin, Howard M., to United States of America, Army. Device for identifying waveforms in a multiple oscilloscope display. 4,132,928, Cl. 315-377.000.

Bernardi, Luigi; Giardino, Pietro; Patelli, Bianca; and Arcamone, Federico, to Societa Farmaceutici Italia S.p.A. Optically active anthracyclinones and process therefor. 4,132,721, Cl. 260-365.000.

Bernstein, David H., to Data General Corporation. Data processing system having a CPU register file and a memory address register separate therefrom. 4,133,028, Cl. 364-200.000.

Bernstein, Seymour: *See*—
Conrow, Ransom B.; and Bernstein, Seymour, 4,132,730, Cl. 260-506.000.
Conrow, Ransom B.; and Bernstein, Seymour, 4,132,850, Cl. 544-196.000.

Bertea Corporation: *See*—
Hussey, David C., 4,132,126, Cl. 74-479.000.
Stevens, Curtis E., 4,132,378, Cl. 244-175.000.

Besozzi, Alfio J., to Denka Chemical Corporation. Process for producing haloprene. 4,132,741, Cl. 260-655.000.

Best, John S.; Hoyles, Ronald; Ingram, Geoffrey S.; and Skinner, Francis B. J., to Lever Brothers Company. Dentifrices. 4,132,773, Cl. 424-57.000.

Bethlehem Steel Corporation: *See*—
Grohowski, Joseph A.; and Galanis, Tom L., 4,133,035, Cl. 364-472.000.

Betz Laboratories, Inc.: *See*—
Schwarz, Richard C.; and Chestang, Bobby G., 4,132,526, Cl. 422-1.000.

Bhakuni, Roop S.; and Laske, Richard F., to Goodyear Tire & Rubber Company, The. Catechol modified resorcinol-formaldehyde latex cord dip. 4,132,693, Cl. 260-29.300.

Bianchi, Valerio; Metcher, Siegfried; Latsch, Reinhard; Weidner, Hans; and Brettschneider, Johannes, to Robert Bosch GmbH. Method and apparatus for fuel mixture control. 4,132,195, Cl. 123-32.0EA.

Biddlecom, William G.: *See*—
Kluender, Harold C.; Woessner, Warren D.; and Biddlecom, William G., 4,132,738, Cl. 260-586.00R.

Bigelow, James H.: *See*—
Barcz, James P.; Bigelow, James H.; Jaeschke, James R.; Piber, Earl T.; and Spellman, Gordon B., 4,132,933, Cl. 318-346.000.

Bihler, Otto. Method for bending wire or strip material into round parts. 4,132,106, Cl. 72-384.000.

Bildstein, Hubert; Petter, Hubert; and Simader, Fritz, to Schwarzkopf Development Corporation. Rotating X-ray target and method for preparing same. 4,132,917, Cl. 313-330.000.

Billeter, Henry R., to Sloan Valve Company. Angle cock. 4,132,388, Cl. 251-175.000.

Bingham, William H. Ladder with retractable rungs. 4,132,288, Cl. 182-156.000.

Binoth, Walter, to ISM Equipements Industriels de Montage SA. Circular transfer table. 4,132,455, Cl. 312-97.100.

Bird, Elizabeth A. Equestrian harness and saddlery equipment. 4,132,055, Cl. 54-23.000.

Birdsall, John D. Game board with pivotal planar member. 4,132,412, Cl. 273-251.000.

bison-werke Bahre and Greten GmbH & Co. KG: *See*—
DeMets, Albert, 4,132,520, Cl. 425-199.000.

Bissinger, William E., to PPG Industries, Inc. Control of plant fungi with S-p-methoxyphenyl N-2,3-dibromopropylthiolcarbamate. 4,132,801, Cl. 424-300.000.

Bittner, Klaus-Jurgen: *See*—
Gerigk, Gunter; Bittner, Klaus-Jurgen; and Kostner, Armin, 4,132,047, Cl. 53-396.000.

BJ-Hughes Inc.: *See*—
Kuus, Felix, 4,132,243, Cl. 137-268.000.

Blackinton, Roswell J., to Inmont Corporation. Apparatus and method for spray application of solvent-thinned coating compositions. 4,132,357, Cl. 239-11.000.

Blacksmith, Philipp; Poirier, J. Leon; and Holt, Frederick S., to United States of America, Air Force. Radar intrusion detection system. 4,132,988, Cl. 340-552.000.

Blackwell, Jennings P.; and Brady, Donnie G., to Phillips Petroleum Company. Poly(arylene sulfide) resin coatings. 4,132,823, Cl. 428-215.000.

Blackwood, Robert S., to FSI Corporation. Apparatus for and method of cleaning and removing static charges from substrates. 4,132,567, Cl. 134-1.000.

Blair, Robert H., to Resistance Welder Corporation. Seam welding method and apparatus. 4,132,880, Cl. 219-114.000.

Blair Tool & Machine Corporation: *See*—
Bergman, John E., 4,132,449, Cl. 300-4.000.

Blaupunkt-Werke GmbH: *See*—
Riechmann, Werner, 4,132,929, Cl. 315-408.000.

Blessinger, James E.: *See*—
Slaats, Mathew A.; Overton, David E.; and Blessinger, James E., 4,132,483, Cl. 366-162.000.

Blichare, Mitchell S.; and Jackson, Gerald J., Jr., to American Cyanamid Company. Process for preparing oral sustained release granules. 4,132,753, Cl. 264-25.000.

Blodgett, Gary C.; and Powers, George H., to Norton Company. Heating element. 4,132,886, Cl. 219-523.000.

Blowers, Albert K.: *See*—
Rohrer, Douglas D.; and Blowers, Albert K., 4,132,299, Cl. 192-58.00B.

BMR Security Products Corp.: *See*—
Young, Bruce, 4,132,315, Cl. 211-4.000.

Bochan, John, to General Electric Company. Start system for domestic appliance. 4,132,009, Cl. 34-45.000.

Bodle, Ronald L.: *See*—
Moore, Leonard W.; Bodle, Ronald L.; and Fiederer, Conrad, 4,133,022, Cl. 361-415.000.

Bodor, Nicolae S.: *See*—
Kaminski, James J.; and Bodor, Nicolae S., 4,132,805, Cl. 424-312.000.

Boehme, Detlef R.; Judah, Kenneth C.; and Luchetti, Stephen J., to

Varian Associates, Inc. Damper for high pressure pumping system. 4,132,511, Cl. 417-540.000.

Boeing Company, The: *See*—
Abell, Clarence L., 4,132,374, Cl. 244-46.000.
Hogenhout, Franciscus, 4,132,108, Cl. 72-430.000.

Bogansky, Vasily V.: *See*—
Gurevich, Vladimir Z.; Prashin, Anatoly A.; Stoyakin, Vyacheslav P.; Ter-Minosian, Sergei M.; Frolov, Valery A.; Tolstykh, Viktor S.; Bogansky, Vasily V.; and Ivanenko, Gennady V., 4,132,339, Cl. 228-103.000.

Bokros, Jack C., to General Atomic Company. Ball and socket prosthetic joint. 4,131,957, Cl. 3-1.910.

Bolea Camprubi, D. Anselmo, to Incotex S.A. Weft selection and retention mechanism for shuttleless looms. 4,132,249, Cl. 139-453.000.

Bolton, Colin B.; and Hermer, Gerald P., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Flotation stoles. 4,131,974, Cl. 9-337.000.

Bongartz, Paul; and Haag, Franz, to Motan Gesellschaft mit beschrankter Haftung. Peristaltic pump with means to vary relative pumping volume between tubes. 4,132,509, Cl. 417-475.000.

Bonora, Anthony C., to Siltec Corporation. Apparatus for polishing semiconductor wafers. 4,132,037, Cl. 51-131.00C.

Bontempi, Paolo, to Comus S.p.A. Volume adjuster for air operated musical instruments. 4,132,144, Cl. 84-359.000.

Booth, Graham R.; Smith, John S.; and Clayton, Malcolm, to English Card Clothing Company Limited, The. Method of making card clothing with a reinforcing back. 4,132,580, Cl. 156-193.000.

Borg-Warner Corporation: *See*—
Arthur, Ralph P.; and Turner, Roy M., 4,132,748, Cl. 260-873.000.
Brown, Richard T.; Halberg, Robert W.; Simmons, John P.; and Holdeman, John W., 4,132,297, Cl. 192-36.000.
Grandia, William M., 4,132,300, Cl. 192-82.00T.
Kountz, Kenneth J., 4,132,086, Cl. 62-209.000.
Roberts, Richard W., 4,132,512, Cl. 418-23.000.

Borman, Willem F. H., to General Electric Company. Preparation of branched poly(alkylene terephthalates). 4,132,707, Cl. 528-273.000.

Bornand, Rene. Machine to work sheet material. 4,132,102, Cl. 72-324.000.

Borts, Abraham: *See*—
Miller, Henry F.; Borts, Abraham; and Weiss, Folker H., 4,132,648, Cl. 210-242.00R.

Bottaccio, Giorgio; Campolmi, Stefano; and Felicioli, Maria G., to Montedison S.p.A. Process for preparing alpha-formyl acids. 4,132,732, Cl. 562-550.000.

Bottomley, James C.; and Nash, Henry G., to Sun Oil Company of Pennsylvania. Two-stage oil skimmer separator. 4,132,645, Cl. 210-104.000.

Bouchet-Lassale S.A.: *See*—
Mathys, Pierre, 4,132,061, Cl. 58-59.000.

Boulanger, Gilbert; and Duret, Georges, to Commissariat a l'Energie Atomique. Electrolytic device for marking metallic parts. 4,132,618, Cl. 204-218.000.

Bouwhuis, Gijsbertus; and van der Wal, Johannes, to U.S. Philips Corporation. Gas discharge laser having an asymmetrical coupling-out mirror. 4,132,959, Cl. 331-94.50C.

Bove, Ottavio; and Cannata, Ugo, to Saipem S.p.A.; and Arcos Saldatura Elettrica Autogena S.p.A. Apparatus suitable for use in the automatic welding of pipes. 4,132,338, Cl. 228-27.000.

Bowen, Robert F.; and Teich, Wesley W., to Raytheon Company. Fluid valve for microwave devices. 4,132,239, Cl. 137-382.000.

Bowlby, Paul D.; Cinkoske, James M.; and Harris, Richard D., to Economation, Inc. Palletizer with controlled stack density. 4,132,321, Cl. 214-6.0DK.

Bowman, Richard J., to United States Steel Corporation. Automatic gauge control method and apparatus for tandem strip mills. 4,132,095, Cl. 72-8.000.

Bowman, Ronald R., to Motorola, Inc. Photoresists with particles less than one micron. 4,132,550, Cl. 96-36.000.

Boyer, Peter W.: *See*—
Grotness, Gunnar; and Boyer, Peter W., 4,132,153, Cl. 91-405.000.

Bradley, Marianne. Method and apparatus for producing extended-length fingernails. 4,132,234, Cl. 132-73.000.

Brady, Donnie G.: *See*—
Blackwell, Jennings P.; and Brady, Donnie G., 4,132,823, Cl. 428-215.000.

Bramstedt, William R.: *See*—
DePablo, Raul S.; Harrington, David E.; and Bramstedt, William R., 4,132,569, Cl. 134-3.000.

Brandberg, Lawrence C.: *See*—
Standing, Charles N.; and Brandberg, Lawrence C., 4,132,811, Cl. 426-111.000.

Brandon, Ralph E.; Ring, Michael; and Morris, James B., to International Paper Company. Entangled non-woven web-forming apparatus. 4,132,592, Cl. 162-216.000.

Bratschun, William R., to Zenith Radio Corporation. Hybrid circuit connector assembly. 4,132,341, Cl. 228-122.000.

Braun Aktiengesellschaft: *See*—
Gahler, Egon; and Dietrich, Rolf, 4,132,923, Cl. 315-151.000.
Gaus, Harry; Johnson, Jeffrey; Milutziki, Udo; and Schotte, Dietwald, 4,132,935, Cl. 318-480.000.

Braun, Martin, to Machlett Laboratories, Inc., The. X-ray focal spot test system. 4,132,654, Cl. 250-320.000.

Breedveld Interieurwerken B.V.: *See*—
Saarloos, Pieter, 4,131,971, Cl. 16-150.000.

Brehm, Michael: *See*—
Weber, Kurt; and Brehm, Michael, 4,132,754, Cl. 264-39.000.

Brenning, Frederick K., Jr. Safety glove. 4,131,952, Cl. 2-2.00R.

Breslow, Jeffrey D.; and Hicks, Alan A., to Marvin Glass & Associates. Game with chance shot dictating pieces. 4,132,411, Cl. 273-119.00R.

Breton, Robert A.: *See*—
Austin, George W., Jr.; Breton, Robert A.; Nolan, James J.; and Striebel, Edmund E., 4,132,066, Cl. 60-39.650.

Brettschneider, Johannes: *See*—
Bianchi, Valerio; Metcher, Siegfried; Latsch, Reinhard; Weidner, Hans; and Brettschneider, Johannes, 4,132,195, Cl. 123-32.0EA.

Briechle, George T.: *See*—
Di Domizio, John A.; Briechle, George T.; and Ell, Douglas, 4,132,990, Cl. 343-7.00A.

Briggs, Eugene C.; Shaftner, Robert F.; and Giambrone, Harry J., to Koehring Company. Window heaters. 4,132,353, Cl. 236-10.000.

British Steel Corporation (Chemicals) Ltd.: *See*—
Bannister, Richard N.; and Hardwick, Frank, 4,132,699, Cl. 260-38.000.

Broadhurst, Michael D., to Stauffer Chemical Company. Process for the preparation of N-substituted halopyrrolidones. 4,132,713, Cl. 260-326.5FL.

Brock, Louis C.; and Nielson, Richard H. Collapsible headgear. 4,131,954, Cl. 2-177.000.

Broecker, Bernhard: *See*—
Gorlitz, Wolf-Dieter; and Broecker, Bernhard, 4,132,692, Cl. 260-29.2EP.

Bromberg, Howard M., to Flexi-Group Inc., The. Slide calculator and method. 4,132,348, Cl. 229-75.000.

Brovedan, Antonio: *See*—
Ferrentino, Antonio; Brovedan, Antonio; and Sala, Angelo, 4,132,756, Cl. 264-174.000.

Browall, Warella R.: *See*—
Kimura, Shiro G.; Lavigne, Raymond G.; and Browall, Warella R., 4,132,824, Cl. 428-220.000.

Brown, Richard T.; Halberg, Robert W.; Simmons, John P.; and Holdeman, John W., to Borg-Warner Corporation. Automatic four-wheel drive system. 4,132,297, Cl. 192-36.000.

Brown, Robert A.: *See*—
Hottel, Hoyt C., Jr.; Brown, Robert A.; Moore, Randall W.; and Sullivan, Paul F., 4,132,462, Cl. 350-117.000.

Brown, William T.; Moran, Robert J.; and LeBlanc, Larry M., to Alphatron Incorporated. Wire twisting system. 4,132,250, Cl. 140-115.000.

Bruck Industries, Inc.: *See*—
Winkler, Alexander, 4,132,582, Cl. 156-209.000.

Bruni, Aldo; and Campari, Luigi, to AMP Incorporated. Electrical switch. 4,132,874, Cl. 200-16.00F.

Bruning Brothers Company, Inc.: *See*—
Azzara, Anthony A., 4,131,993, Cl. 29-768.000.

Buckingham Graphics, Inc.: *See*—
Ferrarell, Michael J., 4,132,013, Cl. 34-160.000.

Budke, Harry T., Jr.: *See*—
Rivers, Jacob B., Jr.; and Budke, Harry T., Jr., 4,132,535, Cl. 55-23.000.

Buelow, Fred K.; Zasio, John J.; and Cooke, Laurence H., to Fujitsu Limited. Overlapping boundary electron exposure system method and apparatus. 4,132,898, Cl. 250-492.00A.

Bugnone, Aldo. Mounting for rotary cylinders, particularly in a printing press. 4,132,166, Cl. 101-247.000.

Buhler, Rudolf: *See*—
Muller, Hans; Buhler, Rudolf; and Rapsomanikis, Nikolas, 4,132,642, Cl. 210-75.000.

Bujan, Albert F., to Abbott Laboratories. Opening device for tear open port of a container. 4,132,135, Cl. 81-3.46A.

Bulley, Norman R.: *See*—
von Beckmann, Joerg W.; and Bulley, Norman R., 4,132,314, Cl. 209-565.000.

Bunke, Klaus, to Bayer Aktiengesellschaft. Spatula for mixing plastic substances. 4,132,502, Cl. 416-70.00R.

Bunker Ramo Corporation: *See*—
Kwan, Okun, 4,132,486, Cl. 400-213.000.

Burke, Oliver W., Jr., deceased (by Scala, Norma, administratrix); and Humphreys, Victor T., to Darrah, Marion; and Houghton, Joseph Y. Intrachromospheruloid pigments and processes for producing same. 4,132,561, Cl. 106-308.00M.

Burke, Oliver W., Jr., deceased (by Scala, Norma, administratrix); and Humphreys, Victor T., to Marion Darrah and Joseph Y. Houghton, Co-trustees. Intrachromospheruloid/inorganic pigment compositions and processes for producing same. 4,132,562, Cl. 106-308.00M.

Burke, Oliver W., Jr., deceased (by Scala, Norma, administratrix); and Humphreys, Victor T., to Darrah, Marion; and Houghton, Joseph Y. Intraleucospheruloid/organic color pigment compositions and processes for producing same. 4,132,563, Cl. 106-308.00M.

Burke, Oliver W., Jr., deceased (by Scala, Norma, administratrix); and Humphreys, Victor T., to Darrah, Marion; and Houghton, Joseph Y. Intraleucospheruloid pigments and processes for producing same. 4,132,564, Cl. 106-308.00M.

Burkholder, Nelson D., to Dow Chemical Company, The. Absorbent articles and methods for their preparation. 4,132,695, Cl. 260-29.6NR.

Burkle, Stephen E.; and Deutsch, Albert S., to Polychrome Corporation. Color proofing guide. 4,132,553, Cl. 96-91.00R.

Burm, Gabriel A. M.: *See*—
Weyers, Jacobus R. M. G.; and Burm, Gabriel A. M., 4,132,192, Cl. 118-658.000.

Burnham, Robert D.: *See—*
Streifer, William; Scifres, Donald R.; and Burnham, Robert D., 4,132,960, Cl. 331-94.50H.

Burov, Boris A.: *See—*
Arendt, Georgy A.; Pokrovsky, Vladimir V.; Burov, Boris A.; Lipovich, Alexandr L.; Romanov, Evgeny I.; Vainshtein, Galina L.; and Khaitovich, Tsalel S., 4,132,317, Cl. 212-49.000.

Burroughs Corporation: *See—*
Hutchison, Robert V.; and Nelson, John A., 4,132,856, Cl. 174-52.0PE.

Burrus, Billy S.; and Woodfill, Michael W., to Combustion Engineering, Inc. Turbine meter bearing. 4,132,453, Cl. 308-238.000.

Burton, Glenn A. Bow string release mechanism. 4,132,215, Cl. 124-35.00A.

Burton, Perry E. Sheet material guidance system. 4,132,184, Cl. 112-262.000.

Busanovich, Charles J.; and Moore, Robert M., to RCA Corporation. Polycrystalline selenium imaging devices. 4,132,918, Cl. 313-386.000.

Bush, Glenn W.; and Austin, Lowell W., to National Steel Corporation. Method of and apparatus for electrolytic treatment of metal. 4,132,609, Cl. 204-28.000.

Butsch, Otto R., to Sycor, Inc. Head positioner for disc recorders. 4,133,015, Cl. 360-109.000.

Buzzelli, Edward S.; and Folser, George R., to Westinghouse Electric Corp. Method of producing self-supporting fully activated iron electrodes by thermal reduction-sintering. 4,132,547, Cl. 75-211.000.

Byers, Thomas L. Animated motion display machine. 4,132,021, Cl. 40-614.000.

Byrt, Graham A. B., to Masson Scott Thrissell Engineering Ltd. Apparatus for web feed. 4,132,371, Cl. 242-58.300.

Byrum, Bernard W.; Ernsthausen, Roger E.; and Fein, Michael E., to Owens-Illinois, Inc. Gaseous display device. 4,132,982, Cl. 313-188.000.

C.A.V. Limited: *See—*
Mowbray, Dorian F., 4,132,508, Cl. 417-462.000.

C-R-O, Inc.: *See—*
Hooper, Harry, 4,132,392, Cl. 266-69.000.

C. S. G. Enterprises, Inc.: *See—*
Garron, Carlos S., 4,132,911, Cl. 310-46.000.

Cableform Limited: *See—*
Morton, John; and Stevens, Keith D., 4,132,934, Cl. 318-382.000.

Caddock, Richard E., Jr. Noninductive film-type cylindrical resistor and method of making it. 4,132,971, Cl. 338-61.000.

Cadwallader, James W., to SPS Technologies, Inc. Method of making self-locking fasteners with a pressure rolled thermoplastic patch. 4,132,815, Cl. 427-194.000.

Cal Pak Industries, Inc.: *See—*
Pastore, Ronald, 4,132,380, Cl. 248-224.100.

Calder, Thelma L.: *See—*
Overman, Kelly C.; and Calder, Thelma L., 4,133,037, Cl. 364-484.000.

Caldwell, Winston A. Radio antenna for motorcycle. 4,132,994, Cl. 343-713.000.

Calgon Corporation: *See—*
Hwang, Mei H., 4,132,674, Cl. 252-500.000.

Calspan Corporation: *See—*
Bergman, Richard C., 4,132,961, Cl. 331-94.5PE.

Cameron Iron Works, Inc.: *See—*
Jones, Marvin R., 4,132,267, Cl. 166-55.000.
Randall, Ross D., 4,132,266, Cl. 166-55.000.
Williams, Leonard E., Jr., 4,132,265, Cl. 166-55.000.

Campari, Luigi: *See—*
Bruni, Aldo; and Campari, Luigi, 4,132,874, Cl. 200-16.00F.

Campbell, Joseph M.; and Finley, William S., to Teledyne Industries, Inc. Solenoid-hammer control system for the re-creation of expression effects from a recorded musical presentation. 4,132,141, Cl. 84-115.000.

Campbell, Joseph M., to Teledyne Industries, Inc. Method and apparatus for reproducing a musical presentation. 4,132,142, Cl. 84-115.000.

Campolmi, Stefano: *See—*
Bottaccio, Giorgio; Campolmi, Stefano; and Felicioli, Maria G., 4,132,732, Cl. 562-550.000.

Camprincoli, Pierpaolo; and Rosati, Luciano, to Montefibre S.p.A. Reinforced conglomerates for the construction or building industry and process for preparing the same. 4,132,556, Cl. 106-90.000.

Canevari, Roger: *See—*
Regnier, Gilbert; Canevari, Roger; and Desnoyers, Pierre, 4,132,787, Cl. 424-230.000.

Cannata, Ugo: *See—*
Bove, Ottavio; and Cannata, Ugo, 4,132,338, Cl. 228-27.000.

Canon Kabushiki Kaisha: *See—*
Endo, Ichiro; Komatsu, Toshiyuki; and Takasu, Yoshio, 4,132,882, Cl. 219-216.000.
Matsumura, Isao, 4,132,466, Cl. 351-7.000.
Sakaguchi, Keiichi; and Someya, Atsushi, 4,132,463, Cl. 350-184.000.

Cape Boards & Panels Ltd.: *See—*
Barrable, Victor E., 4,132,555, Cl. 106-90.000.

Caputo, James P., to Entel Corporation. PABX System providing multiple paths held between calling line circuits and a plurality of output circuits. 4,132,868, Cl. 179-18.00E.

Carbo-Economy, S.A.: *See—*
Petermann, Walter E., 4,132,752, Cl. 261-40.000.

Carborundum Company, The: *See—*
Lohmer, Wilfried; and Schotten, Josef, 4,132,533, Cl. 51-295.000.

Carl Freudenberg, Firma: *See—*
Weber, Kurt; and Brehm, Michael, 4,132,754, Cl. 264-39.000.

Carl Freudenberg, Kommanditgesellschaft: *See—*
Kirsch, Ulrich; and Krull, Manfred, 4,132,650, Cl. 210-491.000.

Carlsson, Carl-Goran H., to PLM AB. Aerobic, thermophilic degradation with enzyme addition. 4,132,638, Cl. 210-7.000.

Carney, William V.: *See—*
De Luca, Paul V.; Carney, William V.; and Louis, Arnold S., 4,132,814, Cl. 427-113.000.

Carp, Gerald: *See—*
Weischedel, Richard C.; and Carp, Gerald, 4,132,947, Cl. 324-77.00A.

Carr, Norman L.; and McGinnis, Edgar L., to Gulf Research & Development Company. Method for separating solids from coal liquids. 4,132,630, Cl. 208-177.000.

Carroll, John D., Jr. Chemical distribution system. 4,132,242, Cl. 137-263.000.

Caruso, Paul J.; and Kurth, William T., to Exxon Research & Engineering Co. Structural support for solar cell array. 4,132,570, Cl. 136-89.00P.

Casey, Gary L.: *See—*
Elpern, David G.; and Casey, Gary L., 4,132,203, Cl. 123-139.0AW.

Casio Computer Co., Ltd.: *See—*
Kashio, Toshio, 4,132,060, Cl. 58-23.00R.
Kashio, Toshio, 4,133,041, Cl. 364-900.000.

Casto, John W. Precise angle drilling attachment. 4,132,496, Cl. 408-112.000.

Castor, William M.; and Taylor, Barbara S., to Dow Chemical Company, The. Reduction of metal surface-initiated cracking in dehydrogenation reactors. 4,132,743, Cl. 260-669.00R.

Casutt, Toni. Folded-up pack for fragile articles. 4,132,346, Cl. 229-28.00R.

Caterpillar Tractor Co.: *See—*
Avery, Bennett W.; Herr, Charles H., Jr.; and Lamport, Ivan R., 4,132,134, Cl. 74-801.000.
Dezelan, Joseph E.; and Mast, Donald R., 4,132,290, Cl. 188-69.000.
Johnson, Howard L., 4,132,245, Cl. 137-377.000.
Shaffer, Walter M., 4,132,132, Cl. 74-732.000.

Caudel, Edward R.: *See—*
Cochran, Michael J.; and Caudel, Edward R., 4,132,950, Cl. 325-25.000.
Cochran, Michael J.; and Caudel, Edward R., 4,132,951, Cl. 325-452.000.

Celanese Corporation: *See—*
Stackman, Robert W.; Rosenthal, Arnold J.; and Sakowitz, Marvin L., 4,132,705, Cl. 526-60.000.

Champenois, Michel M. L., to Produits Chimiques Ugine Kuhlmann. Copolymers of dyes and acrylamide. 4,132,841, Cl. 526-221.000.

Champion Spark Plug Company: *See—*
Grime, Thomas E., 4,132,883, Cl. 219-284.000.

Chandross, Edwin A.; and Freed, Donald J., to Bell Telephone Laboratories, Incorporated. Technique for electrodeposition of water-based polymeric coating. 4,132,608, Cl. 204-27.000.

Chant, John B., to Vessa Limited. Attachments enabling vehicles to negotiate obstacles. 4,132,423, Cl. 280-5.300.

Chappelle, Emmett W.: *See—*
United States of America, National Aeronautics and Space Administration; Picciolo, Grace L.; Chappelle, Emmett W.; Deming, Jody W.; Shrock, Christian G.; Vellend, Hillar; Barza, Michael J.; and Weinstein, Louis, 4,132,599, Cl. 195-103.50K.

Chappelow, Ronald E.; and Hunkele, Harry J., to International Business Machines Corporation. Method of forming deposits from reactive gases. 4,132,818, Cl. 427-248.00R.

Chasteen, Anthony J., to Union Oil Company of California. Generation of electricity during the injection of a dense fluid into a subterranean formation. 4,132,269, Cl. 166-268.000.

Chatterjea, Probir K., to International Harvester Company. Transmission clutches with fully-resetting modulator-load-piston. 4,132,302, Cl. 192-87.130.

Chemap AG: *See—*
Muller, Hans; Buhler, Rudolf; and Rapsomanikis, Nikolas, 4,132,642, Cl. 210-75.000.

Cherednikov, Evgeny N.: *See—*
Tupitsyn, Konstantin K.; Cherednikov, Evgeny N.; Kostylev, Alexandr D.; Plavskikh, Vladimir D.; Klimashko, Vladimir V.; Tkach, Khaim B.; and Karavaev, Andron T., 4,132,277, Cl. 175-19.000.

Chestang, Bobby G.: *See—*
Schwarz, Richard C.; and Chestang, Bobby G., 4,132,526, Cl. 422-1.000.

Chevron Research Company: *See—*
Anderson, David K.; and Stewart, Marvin A., 4,132,652, Cl. 210-536.000.
Davis, Bruce W., 4,132,448, Cl. 299-5.000.
Hotten, Bruce W., 4,132,659, Cl. 252-48.800.
Katsumoto, Kiyoshi; and Marquis, David M., 4,132,670, Cl. 252-437.000.
Offermann, Paul F., 4,132,884, Cl. 219-300.000.

Chibana, Masanobu, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument by digitally calculating harmonics and coefficients. 4,132,140, Cl. 84-1.110.

Chicago Lock Co.: *See—*
Steinbach, Robert L., 4,132,092, Cl. 70-208.000.

Chidester, James T.: *See*—
Thompson, Scott; and Chidester, James T., 4,132,029, Cl. 46-74.00D.
Chikatsu, Tatsusuke; Shimokawa, Shinichi; Miura, Takao; and Okumura, Taro, to Japan Synthetic Rubber Company, Limited. Process for preparing alkali metal dispersions. 4,132,666, Cl. 252-309.000.
Chin, Ronald R.: *See*—
Cleary, Robert J.; and Chin, Ronald R., 4,132,355, Cl. 236-47.000.
Choca, Monica E.; and Feistel, Gerald R., to Nalco Chemical Company. Process for preparing phosphorous-alumina catalysts using polycarboxylic acids as extrusion aids. 4,132,669, Cl. 252-435.000.
Chr. Hausler AG: *See*—
Elsener, Fritz, 4,132,099, Cl. 72-175.000.
Christensen, Per K. Delignification and bleaching of cellulose pulp. 4,132,589, Cl. 162-65.000.
Christian, John B.; and Tamborski, Christ, to United States of America, Air Force. Grease compositions. 4,132,660, Cl. 252-51.50R.
Chrysler Corporation: *See*—
Holdren, Earl J.; Polasek, Peter; and Krzys, Thaddeus W., Jr., 4,132,946, Cl. 324-73.00R.
Teague, Kenneth W., 4,132,204, Cl. 123-139.0AW.
Ciarniello, Giorgio; and De Lena, Oscar, to Societa Italiana Vetro SIV S.p.A. Electrically heated vehicle window having plural moisture sensing probes. 4,132,881, Cl. 219-203.000.
Ciba-Geigy AG: *See*—
Lamb, Frank, 4,132,696, Cl. 260-31.600.
Ciba-Geigy Corporation: *See*—
Berger, Alfred; and Berendt, Hans-Ulrich, 4,132,525, Cl. 8-173.000.
Kvita, Vratislav; Darms, Roland; and Greber, Gerd, 4,132,716, Cl. 260-326.340.
L'Eplattenier, Francois; Pugin, Andre; and von der Crone, Jost, 4,132,708, Cl. 546-7.000.
Petitpierre, Jean C., 4,132,714, Cl. 260-326.50B.
Roth, Martin, 4,132,715, Cl. 260-326.260.
Schmidt, Andreas; and Schwarzenbach, Kurt, 4,132,702, Cl. 260-45.80N.
Cines, Martin R.; and Poska, Forrest L., to Phillips Petroleum Company. Production of carbon monoxide from carbonaceous material and zinc oxide. 4,132,764, Cl. 423-415.00A.
Cinkoske, James M.: *See*—
Bowlby, Paul D.; Cinkoske, James M.; and Harris, Richard D., 4,132,321, Cl. 214-6.0DK.
Cise, Michael D.; and Roy, Michael L., to Eli Lilly and Company. Method of preparing a rapidly dissolving powder of crystalline cephalothin sodium for parenteral administration. 4,132,848, Cl. 544-28.000.
City Technology Limited: *See*—
Tantram, Anthony D. S.; Kent, Michael J.; and Palmer, Alan G., 4,132,616, Cl. 204-195.00P.
Clark, Earl A. Automatic separator valve. 4,132,238, Cl. 137-172.000.
Clark, Robert M.; Cronin, John C.; Reighter, David H.; and Tahiliani, Vasu H., to Gould Inc. Support insulator for gas-filled high-voltage transmission line. 4,132,855, Cl. 174-28.000.
Clarke Chapman Limited: *See*—
Somerville, William M.; and Watson, Edward D., 4,132,387, Cl. 254-173.00R.
Clarke, George C. Variable speed drive. 4,132,121, Cl. 74-230.17A.
Clavin, Edward A., to Midcon Pipeline Equipment Co. Method and apparatus for bending coated pipe including heating the pipe coating by resistance heating. 4,132,104, Cl. 72-342.000.
Clayton, Malcolm: *See*—
Booth, Graham R.; Smith, John S.; and Clayton, Malcolm, 4,132,580, Cl. 156-193.000.
Cleary, Robert J.; and Chin, Ronald R., to Energy Master, Inc. Electronic temperature control system. 4,132,355, Cl. 236-47.000.
Cleland, Edward L.: *See*—
Bank, Herman; and Cleland, Edward L., 4,132,594, Cl. 195-1.800.
Clinton, Edward R., to Dowland-Bach Corporation. Safety valve control system for production well. 4,132,383, Cl. 251-29.000.
Coastal Culvert & Supply, Inc.: *See*—
DeRouen, Rodney P.; and Smith, Timothy, 4,132,385, Cl. 251-147.000.
Cochran, Benjamin T.: *See*—
Frieder, Leonard P., Jr.; and Cochran, Benjamin T., 4,132,861, Cl. 179-1.00P.
Cochran, Michael J.; and Caudel, Edward R., to Texas Instruments Incorporated. Clarifying radio receiver. 4,132,950, Cl. 325-25.000.
Cochran, Michael J.; and Caudel, Edward R., to Texas Instruments Incorporated. Digital processor controlled radio system. 4,132,951, Cl. 325-452.000.
Cohen, Jeffrey M.; and Cohen, Marion D. Extra-focal, convective suppressing solar collector. 4,132,219, Cl. 126-270.000.
Cohen, Marion D.: *See*—
Cohen, Jeffrey M.; and Cohen, Marion D., 4,132,219, Cl. 126-270.000.
Coleman, Richard L.; Witte, Arnold C., Jr.; and Stone, Aubrey L., to Texaco Inc. Process for manufacturing aluminum complex soap thickened grease. 4,132,658, Cl. 252-37.700.
Colgate Palmolive Company: *See*—
Barth, Jordan, 4,132,770, Cl. 424-49.000.
Barth, Jordan B.; and Costello, Christopher H., 4,132,772, Cl. 424-52.000.
Combustion Engineering, Inc.: *See*—
Burrus, Billy S.; and Woodfill, Michael W., 4,132,453, Cl. 308-238.000.
Comer, William T.: *See*—
Martin, Tellis A.; and Comer, William T., 4,132,802, Cl. 424-303.000.
Commissariat a l'Energie Atomique: *See*—
Boulanger, Gilbert; and Duret, Georges, 4,132,618, Cl. 204-218.000.
Compagnie Generale d'Electricite: *See*—
Jacquelin, Jean, 4,132,623, Cl. 204-275.000.
Compagnie Industrielle de Mecanismes: *See*—
Periou, Pierre, 4,131,989, Cl. 29-596.000.
Compagnie Industrielle des Telecommunications Cit-Alcatel: *See*—
Ferret, Francois; Doussoux, Pierre; and Le Nen, Yvon, 4,132,862, Cl. 179-15.0AF.
Compagnie Internationale pour l'Informatique Cii-Honeywell Bull: *See*—
Mercier, Denis L., 4,132,978, Cl. 340-146.3ED.
Comus S.p.A.: *See*—
Bontempi, Paolo, 4,132,144, Cl. 84-359.000.
Conn, Donald J., to United States of America, Army. Blast actuated detent. 4,132,150, Cl. 89-1.806.
Connolly, Michael G.: *See*—
Lewis, David G. A.; and Connolly, Michael G., 4,132,456, Cl. 312-223.000.
Conrow, Ransom B.; and Bernstein, Seymour, to American Cyanamid Company. Ureylene naphthalene sulfonic acids. 4,132,730, Cl. 260-506.000.
Conrow, Ransom B.; and Bernstein, Seymour, to American Cyanamid Company. Tri-substituted triazines. 4,132,850, Cl. 544-196.000.
Contaldo, Attilio, to SPS Technologies, Inc. Store retention and release mechanism. 4,132,147, Cl. 89-1.50G.
Continental Oil Company: *See*—
Pell, Melvyn B., 4,132,628, Cl. 208-108.000.
Cook, Ronald G. T.: *See*—
Skinner, Alexander; and Cook, Ronald G. T., 4,132,089, Cl. 64-2.00R.
Cooke, Laurence H.: *See*—
Buelow, Fred K.; Zasio, John J.; and Cooke, Laurence H., 4,132,898, Cl. 250-492.00A.
Cookson, Alan H.: *See*—
Kemeny, George A.; and Cookson, Alan H., 4,132,854, Cl. 174-27.000.
Coolbroth, Frank P.: *See*—
Peterson, Earl C.; and Coolbroth, Frank P., 4,132,625, Cl. 204-299.00R.
Corbett, David F.: *See*—
Howarth, Thomas T.; Stirling, Irene; and Corbett, David F., 4,132,712, Cl. 260-307.0FA.
Corken Pump Company: *See*—
Kennedy, Garth P.; Kennedy, William A., Jr.; Kennedy, Neal R.; and Elder, John W., 4,132,237, Cl. 137-75.000.
Cornelius, Gail: *See*—
Olson, Lloyd C.; and Cornelius, Gail, 4,132,244, Cl. 137-344.000.
Cornell Research Foundation Inc.: *See*—
Resler, Edwin L., Jr., 4,132,209, Cl. 123-169.00R.
Corning Glass Works: *See*—
Eolin, Robert W.; Foster, Gordon F.; Mach, Joseph F.; and Maschmeyer, Richard O., 4,132,538, Cl. 65-32.000.
Corompt, Antoine. Loading mechanism for a multiple use container. 4,132,325, Cl. 214-515.000.
Corsi, George L.; and Smith, Stanley N., to Federal-Mogul Corporation. Shaft seal. 4,132,421, Cl. 277-166.000.
Cosden Technology, Inc.: *See*—
Watson, James M., 4,132,601, Cl. 203-9.000.
Watson, James M., 4,132,602, Cl. 203-9.000.
Watson, James M., 4,132,603, Cl. 203-9.000.
Costal Services, Inc.: *See*—
Deland, Robert E., 4,132,010, Cl. 34-60.000.
Costello, Christopher H.: *See*—
Barth, Jordan B.; and Costello, Christopher H., 4,132,772, Cl. 424-52.000.
Cot, Louis: *See*—
Parant, Bernard; Cot, Louis; Granier, William; and Durand, Jean-Henri, 4,132,572, Cl. 148-6.15R.
Cottingham, Robert A., to Polymer Corporation, The. Bar stock guides tubes for metal working machines and sound-damping liners for such tubes. 4,131,964, Cl. 10-162.00R.
Coulaloglou, Costas A., to Exxon Research & Engineering Co. Fluidization of permanently magnetic particle beds. 4,132,005, Cl. 34-10.000.
Cournoyer, George R.; Woody, Robert E.; and Baker, John R., to Baker Perkins Inc. Pan stacking system. 4,132,320, Cl. 214-6.00H.
Coutard, Jean-Pierre G.; and Picandet, Jean A., to Jeumont-Schneider. Concentration network for a time division multiplex telephone exchange with pulse amplitude modulation. 4,132,866, Cl. 179-15.0AQ.
Coville, Michael W. C., to American Cyanamid Company. Treatment of acrylamide polymer gel. 4,132,844, Cl. 528-499.000.
Covington, Robert A., Jr.; and Ekiner, Okan M., to Du Pont de Nemours, E. I., and Company. Mechanical dewatering process for elastomer slurries. 4,132,845, Cl. 528-499.000.
CPC International Inc.: *See*—
Hebeda, Ronald E.; Holik, Dennis J.; and Leach, Harry W., 4,132,595, Cl. 195-31.00R.
Craig, Fred A., to FMC Corporation. Track bushing machine and method. 4,132,063, Cl. 59-7.000.

Craighead, James W.: *See*—
Eadie, Brian K. M.; Craighead, James W.; McKerrell, Alistair A.; Wilson, Robert; and White, William A., 4,132,058, Cl. 57-125.000.
Cramm, Gunther; Kranz, Eckart; and Hellrung, Gunter, to Bayer Aktiengesellschaft. Preparation of 4-alkylthiosemicarbazides. 4,132,736, Cl. 260-552.0SC.
Crausbay, Don. Electric power generating system. 4,132,901, Cl. 290-53.000.
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Crespy, Guy; Matthey, Pierre; and Gutjahr, Manfred A., to Daimler-Benz Aktiengesellschaft Stuttgart-Untertuerkheim. Process for the manufacture of electrodes. 4,132,606, Cl. 204-2.100.
Crest Industries, Inc.: *See*—
Rasmussen, Harry R., 4,132,860, Cl. 179-99.000.
Crochemore, Michel M.; and Gay, Michel M., to Rhone-Poulenc Industries. Stabilization of vinyl chloride polymers by means of lactone compounds. 4,132,703, Cl. 260-45.80A.
Cronin, John C.: *See*—
Clark, Robert M.; Cronin, John C.; Reighter, David H.; and Tahiliani, Vasu H., 4,132,855, Cl. 174-28.000.
Croopnick, Gerald A.; Michaels, John M.; and Paul, Donald G., to Dresser Industries, Inc. Gasket arrangement for purification apparatus. 4,132,649, Cl. 210-347.000.
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Kiss, Laszlo; Csillag, Laszlo; Halmai, Karoly; and Miskolczi, Laszlo, 4,132,910, Cl. 310-12.000.
Culver, Irven H.; and Szymber, Oleg, to Southwestern Industries, Inc. Cold-rolling of large diameter gears. 4,132,098, Cl. 72-102.000.
Cummings, William M.; and Powell, Justin C., to Texaco Inc. Detergent additive and motor fuel composition. 4,132,531, Cl. 44-63.000.
Cunningham, Peter E., to United States of America, Army. System for aligning whip antenna matching base units. 4,132,945, Cl. 324-58.00C.
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Cuomo, Jerome J.; Gambino, Richard J.; and Harper, James M. E., to International Business Machines Corporation. Etching by sputtering from an intermetallic target to form negative metallic ions which produce etching of a juxtaposed substrate. 4,132,614, Cl. 204-192.0EC.
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DeBruyne, Neil A., 4,132,131, Cl. 74-675.000.
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Cusano, Carmen M.: *See*—
Waldbillig, James O.; and Cusano, Carmen M., 4,132,661, Cl. 252-51.50A.
Cutler-Hammer, Inc.: *See*—
Barcz, James P.; Bigelow, James H.; Jaeschke, James R.; Piber, Earl T.; and Spellman, Gordon B., 4,132,933, Cl. 318-346.000.
Shanebrook, Robert E., 4,132,875, Cl. 200-61.130.
Dacon Display Services Limited: *See*—
Lewis, David G. A.; and Connolly, Michael G., 4,132,456, Cl. 312-223.000.
Dai Nippon Insatsu Kabushiki Kaisha: *See*—
Kubota, Tetsuo; Noshiro, Atsumi; and Suzuki, Norimoto, 4,132,350, Cl. 235-493.000.
Daigle, Phillip R., to Litton Business Systems, Inc. Removable keyboard switch. 4,132,877, Cl. 200-296.000.
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Kania, Sigmund; and Frank, Wolfgang, 4,132,158, Cl. 98-2.180.
von der Ohe, Manfred, 4,132,431, Cl. 280-691.000.
Daimler-Benz Aktiengesellschaft Stuttgart-Untertuerkheim: *See*—
Crespy, Guy; Matthey, Pierre; and Gutjahr, Manfred A., 4,132,606, Cl. 204-2.100.
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Durr, Frederick E.; and Damiani, Martin R., 4,132,797, Cl. 424-270.000.
Damico, George L., to Westvaco Corporation. Dry toner electrofax paper. 4,132,834, Cl. 428-511.000.
Danks, Barbara A., to Abbott Laboratories. Spill and tamper resistant safety closure. 4,132,334, Cl. 222-490.000.
Dantlgraber, Jorg, to G.L. Rexroth G.m.b.H. Pressure and volume-flow control for variable pump. 4,132,506, Cl. 417-218.000.
Darms, Roland: *See*—
Kvita, Vratislav; Darms, Roland; and Greber, Gerd, 4,132,716, Cl. 260-326.340.
Darrah, Marion: *See*—
Burke, Oliver W., Jr., deceased; and Humphreys, Victor T., 4,132,561, Cl. 106-308.00M.
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Data General Corporation: *See*—
Bernstein, David H., 4,133,028, Cl. 364-200.000.
d'Auria, Luigi: *See*—
Jacques, Andre; d'Auria, Luigi; and Moronville, Chantal, 4,132,461, Cl. 350-96.200.
Davidson, John B.: *See*—
Timberlake, Cecil H.; Viverette, Willie E., Jr.; and Davidson, John B., 4,132,443, Cl. 294-97.000.
Davis, Bruce W., to Chevron Research Company. Method of recovering coal in aqueous slurry form. 4,132,448, Cl. 299-5.000.
Davis, Leo C. Bowling training device. 4,132,407, Cl. 273-54.00B.
Davis, Otis L., III: *See*—
Smith, Donald D.; Davis, Otis L., III; and Heiniger, Richard, 4,132,181, Cl. 111-7.000.
Davis, Paul C., to Bell Telephone Laboratories, Incorporated. Full wave rectifier circuit. 4,132,907, Cl. 307-255.000.
Davison, John B.: *See*—
Wynne, Kenneth J.; and Davison, John B., 4,132,842, Cl. 528-33.000.
Day, Timothy T. Vacuum packaging bulk commodities. 4,132,048, Cl. 53-434.000.
Dayco Corporation: *See*—
Neroni, Peter J.; and Kleykamp, Donald L., 4,132,576, Cl. 156-143.000.
Dayton Sure-Grip & Shore Company, The: *See*—
Sullivan, Ralph G., 4,132,045, Cl. 52-685.000.
Debard, Andre, to Aerosol Inventions and Development S.A. AID SA. Dispensing unit for an aerosol container. 4,132,333, Cl. 222-402.130.
DeBruyne, Neil A., to Curtiss-Wright Corporation. Free-floating planetary transmission with contra-rotating dual output shafts. 4,132,131, Cl. 74-675.000.
Deininger, Gunter; and Soyez, Werner, to Veba-Chemie Aktiengesellschaft. Process for the preparation of carbon black pellets. 4,132,671, Cl. 252-445.000.
deJong, Leendert W. C. Separating device to separate two liquids of different specific gravity. 4,132,651, Cl. 210-522.000.
DeJovine, James M.: *See*—
DeVries, Donald L.; and DeJovine, James M., 4,132,656, Cl. 252-30.000.
Dekhterman, Abram S.: *See*—
Nametkin, Nikolai S.; Matveev, Mikhail S.; Gubin, Sergei P.; Dekhterman, Abram S.; Tjurin, Vladimir D.; Skibenko, Anatoly P.; Orlova, Valentina S.; Savenko, Alevtina I.; and Podolskaya, Irina P., 4,132,631, Cl. 208-236.000.
Deland, Robert E., to Costal Services, Inc. Mobile sand de-oiling apparatus. 4,132,010, Cl. 34-60.000.
De Lena, Oscar: *See*—
Ciarniello, Giorgio; and De Lena, Oscar, 4,132,881, Cl. 219-203.000.
Dellrud, Rolf L.; and Hallberg, Torsten R., to Luftkonditionering AB. Noiseless air flow device and method. 4,132,159, Cl. 98-42.00R.
DeLuca, John A.: *See*—
Yang, Kei-Hsiung; and DeLuca, John A., 4,132,962, Cl. 331-94.50F.
De Luca, Paul V.; Carney, William V.; and Louis, Arnold S., to Porta Systems Corp. Anti-dusting process for carbon resistors. 4,132,814, Cl. 427-113.000.
DEMAG Aktiengesellschaft: *See*—
Komma, Gerhard; Kothe, Dieter; and Rahmfeld, Werner, 4,132,261, Cl. 164-448.000.
De Majistre, Robert: *See*—
Wismer, Marco; and De Majistre, Robert, 4,132,822, Cl. 428-196.000.
DeMets, Albert, to bison-werke Bahre and Greten GmbH & Co. KG. Apparatus for the production of a middle layer of chipboards or the like and/or for the manufacture of chipboards consisting essentially only of one middle layer. 4,132,520, Cl. 425-199.000.
Deming, Jody W.: *See*—
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Demozay, Daniel, to Philagro S.A. Isopropyl parathion as an insecticide for treating soil. 4,132,785, Cl. 424-218.000.
Denka Chemical Corporation: *See*—
Besozzi, Alfio J., 4,132,741, Cl. 260-655.000.
Denki Onkyo Company, Limited: *See*—
Masuda, Noboru; and Sugimoto, Shoichi, 4,132,970, Cl. 338-32.00R.
Dennis, Charles L.: *See*—
Gournay, Luke S.; Harrell, John W.; and Dennis, Charles L., 4,132,943, Cl. 324-6.000.
DePablo, Raul S.; Harrington, David E.; and Bramstedt, William R., to Diamond Shamrock Corporation. Ruthenium recovery process. 4,132,569, Cl. 134-3.000.
DeRoo, Anthony M.: *See*—
Dickert, Yancey J.; and DeRoo, Anthony M., 4,132,831, Cl. 428-458.000.
DeRouen, Rodney P.; and Smith, Timothy, to Coastal Culvert & Supply, Inc. Cam-lock water gate. 4,132,385, Cl. 251-147.000.
Deschaaf, Clifford L., to Whirlpool Corporation. Control circuit for drier. 4,132,008, Cl. 34-45.000.
Deschenes, Charles E.; and Ingalls, Jeffrey D., to GTE Sylvania Incorporated. Remote fixture aiming device. 4,132,004, Cl. 33-366.000.
Desnoyers, Pierre: *See*—
Regnier, Gilbert; Canevari, Roger; and Desnoyers, Pierre, 4,132,787, Cl. 424-230.000.

DeSota, Inc.: *See—*
Berenschot, Donald J.; Anders, Dale F.; and Hawker, Fred D., 4,132,688, Cl. 260-22.0CB.
Desrosier, Norman W. Contextured semimoist meat analogs. 4,132,809, Cl. 426-104.000.
Dessauer, Guido; Leisner, Egon; and Rohr, Alfred, to Feldmuhle Aktiengesellschaft. Disposable blanket for an offset printing machine. 4,132,826, Cl. 428-314.000.
Deutsch, Albert S.: *See—*
Burkle, Stephen E.; and Deutsch, Albert S., 4,132,553, Cl. 96-91.00R.
Deutsch, Reinhard: *See—*
Erdmann, Otto; Deutsch, Reinhard; Symmanek, Horst; and Rudszinat, Willy, 4,132,398, Cl. 271-9.000.
Devereaux, Richard A. Security system. 4,132,987, Cl. 340-506.000.
DeVries, Donald L.; and DeJovine, James M., to Atlantic Richfield Company. Solid particles containing lubricating oil composition and method for using same. 4,132,656, Cl. 252-30.000.
Devroede, Emile M.: *See—*
Eernstman, Tjeerd; Auger, Christopher J.; and Devroede, Emile M., 4,132,690, Cl. 260-23.0AR.
Dezelan, Joseph E.; and Mast, Donald R., to Caterpillar Tractor Co. Locking mechanism for movable vehicle members. 4,132,290, Cl. 188-69.000.
Diamond Shamrock Corporation: *See—*
DePablo, Raul S.; Harrington, David E.; and Bramstedt, William R., 4,132,569, Cl. 134-3.000.
Diamond Shamrock Technologies S.A.: *See—*
Nidola, Antonio; and Spaziante, Placido M., 4,132,620, Cl. 204-242.000.
Dickert, Yancey J.; and DeRoo, Anthony M., to Dow Chemical Company, The. Laminates having a linear, acylated polyalkylenepolyamine intermediate binding layer and a method of preparation. 4,132,831, Cl. 428-458.000.
Dickinson, Stuart M.: *See—*
Ineson, Norman; Dickinson, Stuart M.; and Livingstone, Charles E., 4,132,367, Cl. 242-47.100.
Di Domizio, John A.; Briechle, George T.; and Ell, Douglas, to United Technologies Corporation. AMTI target/clutter discriminator. 4,132,990, Cl. 343-7.00A.
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Nakayama, Kenji; and Yamanoi, Koji, 4,132,202, Cl. 123-139.0AP.
Dietrich, Rolf: *See—*
Gahler, Egon; and Dietrich, Rolf, 4,132,923, Cl. 315-151.000.
Di Maio, Vincent. Door structure and method for forming such structure. 4,132,042, Cl. 52-309.100.
Dimensional Development Corp.: *See—*
Lo, Allen K. W.; and Nims, Jerry C., 4,132,468, Cl. 353-7.000.
Dingwall, Andrew G. F., to RCA Corporation. Insulated gate field effect transistor having a deep channel portion more highly doped than the substrate. 4,132,998, Cl. 357-23.000.
Dinsdale, Jack. Gramophone turntable apparatus. 4,132,414, Cl. 274-39.00R.
Disko, Harry: *See—*
Hicks, Alan A.; and Disko, Harry, 4,132,155, Cl. 93-1.00G.
DiStefano, Thomas H.: *See—*
Cuomo, Jerome J.; DiStefano, Thomas H.; and Rosenberg, Robert, 4,132,571, Cl. 148-1.500.
Diversey Corporation, The: *See—*
Parant, Bernard; Cot, Louis; Granier, William; and Durand, Jean-Henri, 4,132,572, Cl. 148-6.15R.
Dr. Ing. h.c.F. Porsche AG, Firma: *See—*
Bantle, Manfred, 4,132,430, Cl. 280-673.000.
Dodds, Rand E., to J. J. Dill Company. Simplified blank forming a rodent poison container. 4,132,026, Cl. 43-131.000.
Dohi, Nobuyasu; and Obata, Keigo, to Hyogo Prefectural Government. Method of bright electroplating of tin-lead alloy. 4,132,610, Cl. 204-43.00S.
Doi, Yuzuru; Kawahara, Masanao; and Tejima, Yasuyuki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Adjusting structure in an aspheric lens grinding apparatus. 4,132,036, Cl. 51-124.00L.
Dolan, John E. Dispensation of concentrated solution into toilet flush tank. 4,131,958, Cl. 4-227.000.
Doorakian, George A.; and Duquette, Lawrence G., to Dow Chemical Company, The. Latent catalysts for promoting reaction of epoxides with phenols and/or carboxylic acids. 4,132,706, Cl. 528-89.000.
Doremus, John F., to Avon Products, Inc. Apparatus for forming and polishing soap billets. 4,132,521, Cl. 425-383.000.
Dorsch, Robert E., to Uniroyal, Inc. Shipping system for liquids and powders. 4,132,310, Cl. 206-386.000.
Doussoux, Pierre: *See—*
Ferret, Francois; Doussoux, Pierre; and Le Nen, Yvon, 4,132,862, Cl. 179-15.0AF.
Dow Chemical Company, The: *See—*
Burkholder, Nelson D., 4,132,695, Cl. 260-29.6NR.
Castor, William M.; and Taylor, Barbara S., 4,132,743, Cl. 260-669.00R.
Dickert, Yancey J.; and DeRoo, Anthony M., 4,132,831, Cl. 428-458.000.
Doorakian, George A.; and Duquette, Lawrence G., 4,132,706, Cl. 528-89.000.
Malhotra, Sudarshan K., 4,132,783, Cl. 424-200.000.
Malhotra, Sudarshan K., 4,132,784, Cl. 424-200.000.
Dowland-Bach Corporation: *See—*
Clinton, Edward R., 4,132,383, Cl. 251-29.000.
Dowty Mining Equipment Limited: *See—*
Walker, John H.; and Sutton, James A., 4,132,081, Cl. 405-296.000.
Draganov, Samuel M. Fire-retardant composition and method of rendering cellulosic materials fire-retardant. 4,132,655, Cl. 252-8.100.
Dresser Industries, Inc: *See—*
Croopnick, Gerald A.; Michaels, John M.; and Paul, Donald G., 4,132,649, Cl. 210-347.000.
Drozdova, Larisa A.: *See—*
Khutoretsky, Garri M.; Vorontsov, Alexandr I.; Drozdova, Larisa A.; and Yanik, Boris S., 4,132,914, Cl. 310-184.000.
Du, Elbert, to Frye Copysystems, Inc. Pressure sensitive magnetic image transfer media. 4,132,835, Cl. 428-522.000.
Dubroeucq, Georges; and Lacombat, Michael, to Thomson-CSF. Pattern transfer optical system. 4,132,479, Cl. 355-71.000.
Dufresne, Jacques. Emergency brake. 4,132,292, Cl. 188-171.000.
Dugois, Jean-Pierre: *See—*
Morel, Paul; Dugois, Jean-Pierre; and Langon, Bernard, 4,132,621, Cl. 204-243.00M.
Duke, Gene L. Pelletizing cotton lint. 4,132,807, Cl. 426-2.000.
Dulude, Charles R. Apparatus and method for making gun targets. 4,132,000, Cl. 33-174.00B.
Dunne, Maurice J.: *See—*
Engelberger, Joseph F.; Dunne, Maurice J.; and Rogers, Peter F., 4,132,937, Cl. 318-568.000.
Duoroll A.G.: *See—*
Lehner, Aladar; and Varga, Istvan, 4,132,425, Cl. 280-11.230.
Du Pont de Nemours, E. I., and Company: *See—*
Covington, Robert A., Jr.; and Ekiner, Okan M., 4,132,845, Cl. 528-499.000.
Marquisee, Mark J.; and Sandell, Lionel S., 4,132,560, Cl. 106-288.00B.
Moore, Earl P., Jr., 4,132,729, Cl. 260-465.50R.
Valdsaar, Herbert, 4,132,534, Cl. 51-307.000.
Yates, Paul C., 4,132,765, Cl. 423-484.000.
Duquette, Lawrence G.: *See—*
Doorakian, George A.; and Duquette, Lawrence G., 4,132,706, Cl. 528-89.000.
Durand, Jean-Henri: *See—*
Parant, Bernard; Cot, Louis; Granier, William; and Durand, Jean-Henri, 4,132,572, Cl. 148-6.15R.
Duret, Georges: *See—*
Boulanger, Gilbert; and Duret, Georges, 4,132,618, Cl. 204-218.000.
Durr, Frederick E.; and Damiani, Martin R., to American Cyanamid Company. Method of stimulating leukemic immune response. 4,132,797, Cl. 424-270.000.
Durst (U.K.) Limited: *See—*
Long, John G.; and Watts, Nicholas P., 4,132,478, Cl. 355-71.000.
Duwe, Edward C.; and Duwe, William E. Method of making modular crypts. 4,132,046, Cl. 52-745.000.
Duwe, William E.: *See—*
Duwe, Edward C.; and Duwe, William E., 4,132,046, Cl. 52-745.000.
Eadie, Brian K. M.; Craighead, James W.; McKerrell, Alistair A.; Wilson, Robert; and White, William A., to Textile Mouldings Limited. Insert traveller. 4,132,058, Cl. 57-125.000.
Easco-Sparcatron, Inc.: *See—*
O'Connor, Thomas J., 4,132,038, Cl. 51-204.000.
Eastman Kodak Company: *See—*
Eikenberry, Jon N.; Sanford, Karl J.; and Sutton, Richard C., 4,132,528, Cl. 23-230.00B.
Harvey, Donald M., 4,132,469, Cl. 353-25.000.
Irick, Gether, Jr.; and Kelly, Charles A., 4,132,704, Cl. 260-45.8NT.
Sandhu, M. Akram, 4,132,833, Cl. 428-481.000.
Eaton Corporation: *See—*
Bart, Hansueli, 4,132,201, Cl. 123-139.00E.
McDermott, Hugh L., 4,132,090, Cl. 64-9.00R.
Merritt, Robert C., 4,132,205, Cl. 123-139.0BC.
Richards, Elmer A., 4,132,122, Cl. 74-339.000.
Roggenkamp, George H., 4,132,128, Cl. 74-527.000.
Rohrer, Douglas D.; and Blowers, Albert K., 4,132,299, Cl. 192-58.00B.
Eckelt, Michael: *See—*
Heyden, Rudi; Asbeck, Adolf; Eckelt, Michael; and Gress, Wolfgang, 4,132,694, Cl. 260-29.60R.
Eckerle, Otto. High pressure hydraulic gear pump or motor. 4,132,514, Cl. 418-71.000.
Ecodyne Corporation: *See—*
Furlong, Donn B., 4,132,264, Cl. 165-179.000.
Lankenau, Henry G.; and Flores, Alfonso R., 4,132,587, Cl. 159-27.00A.
Economation, Inc.: *See—*
Bowlby, Paul D.; Cinkoske, James M.; and Harris, Richard D., 4,132,321, Cl. 214-6.0DK.
Edanbob Corporation: *See—*
Wegner, John F.; and Heyek, Walter, 4,132,019, Cl. 40-349.000.
Edwards, Robert H.; and Williams, Thomas A., to Albright & Wilson Limited. Process for removing solvent from the raffinate of extracted phosphoric acid and for preparing phosphate salts. 4,132,540, Cl. 71-34.000.
Eernstman, Tjeerd; Auger, Christopher J.; and Devroede, Emile M., to Allied Chemical Corporation. Adhesive polyamide resin compositions containing high acid number copolymers. 4,132,690, Cl. 260-23.0AR.
Ehrhardt, John R.; and Monser, George J., to Raytheon Company. Antenna element. 4,132,993, Cl. 343-705.000.

Eichenlaub, Dennis P., to Westinghouse Electric Corp. True mean rate measuring system. 4,133,039, Cl. 364-554.000.

Eikenberry, Jon N.; Sanford, Karl J.; and Sutton, Richard C., to Eastman Kodak Company. Analytical element for the analysis of liquids under high pH conditions. 4,132,528, Cl. 23-230.00B.

Eisai Co., Ltd.: *See—*
Tohmatsu, Jun-ichi; Morimoto, Tomiaki; and Kishi, Emiko, 4,132,767, Cl. 424-1.000.

Ejik, Adam J., to M&T Chemical Inc. Lubricant composition for vinyl chloride polymers. 4,132,691, Cl. 260-23.0XA.

Ekiner, Okan M.: *See—*
Covington, Robert A., Jr.; and Ekiner, Okan M., 4,132,845, Cl. 528-499.000.

Elder, John W.: *See—*
Kennedy, Garth P.; Kennedy, William A., Jr.; Kennedy, Neal R.; and Elder, John W., 4,132,237, Cl. 137-75.000.

Eleanor & Wilson Greatbatch Foundation: *See—*
Greatbatch, Wilson, 4,132,836, Cl. 429-91.000.

Electro Switch Corp.: *See—*
MacLean, Alexander, 4,133,020, Cl. 361-156.000.

Eli Lilly and Company: *See—*
Cise, Michael D.; and Roy, Michael L., 4,132,848, Cl. 544-28.000.
Gorman, Marvin; Higgens, Calvin E.; and Nagarajan, Ramakrishnan, 4,132,790, Cl. 424-246.000.
Hamill, Robert L.; and Hoehn, Marvin M., 4,132,778, Cl. 424-121.000.
Molloy, Bryan B., 4,132,737, Cl. 260-578.000.

Elkerton, George D.: *See—*
Schmutzer, Joel J.; and Elkerton, George D., 4,132,925, Cl. 315-208.000.

Ell, Douglas: *See—*
Di Domizio, John A.; Briechle, George T.; and Ell, Douglas, 4,132,990, Cl. 343-7.00A.

Ellis, John D.: *See—*
Ore, Fernando; Ellis, John D.; and Moore, James H., 4,132,760, Cl. 423-167.000.

Elpern, David G.; and Casey, Gary L., to Bendix Corporation, The. Single point intermittent flow fuel injection. 4,132,203, Cl. 123-139.0AW.

Elsener, Fritz, to Chr. Hausler AG. Four-roller workpiece bending machine. 4,132,099, Cl. 72-175.000.

Elsworth, Robert M., to General Electric Company. Filter assembly and method of filtering. 4,132,641, Cl. 210-73.00R.

Emery Industries, Inc.: *See—*
Sturwold, Robert J., 4,132,662, Cl. 252-56.00R.

EMI Limited: *See—*
Froggatt, Robert J., 4,132,895, Cl. 250-445.00T.
Smith, William E.; and Rorden, Robert J., 4,132,900, Cl. 250-491.000.

Endo, Ichiro; Komatsu, Toshiyuki; and Takasu, Yoshio, to Canon Kabushiki Kaisha. Process and apparatus for fixing toner with heat and a fixing agent. 4,132,882, Cl. 219-216.000.

Energy Master, Inc.: *See—*
Cleary, Robert J.; and Chin, Ronald R., 4,132,355, Cl. 236-47.000.

Engall, Fred, to Bauer Bros. Co., The. Infeed tube for disc refiners. 4,132,366, Cl. 241-245.000.

Engelberger, Joseph F.; Dunne, Maurice J.; and Rogers, Peter F., to Unimation, Inc. Programmable manipulator with dynamic feedback apparatus for stabilization. 4,132,937, Cl. 318-568.000.

Enginor AG: *See—*
Akeret, Richard, 4,132,078, Cl. 60-682.000.

English Card Clothing Company Limited, The: *See—*
Booth, Graham R.; Smith, John S.; and Clayton, Malcolm, 4,132,580, Cl. 156-193.000.

Entel Corporation: *See—*
Caputo, James P., 4,132,868, Cl. 179-18.00E.

Enviro-Blast International: *See—*
Gilbert, Neal J.; and Horton, Edward L., 4,132,039, Cl. 51-424.000.

Enyeart, J. Walter: *See—*
Hutchins, Ned M.; Enyeart, J. Walter; and Holbrook, Leon G., 4,132,172, Cl. 102-30.000.

Eolin, Robert W.; Foster, Gordon F.; Mach, Joseph F.; and Maschmeyer, Richard O., to Corning Glass Works. Injection molding hydrosilicates. 4,132,538, Cl. 65-32.000.

Erdmann, Otto; Deutsch, Reinhard; Symmanek, Horst; and Rudszinat, Willy, to Hauni-Werke Korber & Co. KG. Apparatus for removing sheets from stacks. 4,132,398, Cl. 271-9.000.

Erickson, Donald C. Separation of oxygen from gaseous mixtures with molten alkali metal salts. 4,132,766, Cl. 423-579.000.

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Gryaznov, Vladimir M.; Smirnov, Viktor S.; Vdovin, Valentin M.; Ermilova, Margarita M.; Gogua, Lia D.; Pritula, Nina A.; and Litvinov, Igor A., 4,132,668, Cl. 252-430.000.

Ernst Leitz Wetzlor GmbH: *See—*
Leiter, Herbert, 4,132,891, Cl. 250-239.000.

Ernsthausen, Roger E.: *See—*
Byrum, Bernard W.; Ernsthausen, Roger E.; and Fein, Michael E., 4,132,982, Cl. 313-188.000.

Escriva, Vincent R.; Kirtikar, Suvrat; Marshall, Edward W.; and Minard, Charles D., to Varian Associates, Inc. Electrostatic recording head having wire styli and method of manufacture. 4,131,986, Cl. 29-592.00R.

Esposito, John D. Variable alignment window assembly. 4,132,033, Cl. 49-71.000.

Esrac Computer Corporation: *See—*
Sinn, Robert S., 4,133,031, Cl. 364-412.000.

Ethyl Corporation: *See—*
Stephens, Ruth E., deceased; and Stephens, William L., executor, 4,132,700, Cl. 260-42.140.

Etter, Berwyn E. Method and means of assimilating utility meter data. 4,133,034, Cl. 364-464.000.

Evans Products Company: *See—*
Zabonick, Jerry L., 4,132,301, Cl. 192-85.0AA.

Everest, Charles E., to Telatemp Corporation. Switch. 4,132,902, Cl. 307-116.000.

Evett, Joel. Shift lever and integral handbrake apparatus. 4,132,296, Cl. 192-4.00R.

Ewald, Jerome T., to Bendix Corporation, The. Master cylinder assembly. 4,132,073, Cl. 60-562.000.

Exxon Production Research Company: *See—*
Holland, Warren E., 4,132,270, Cl. 166-314.000.

Exxon Research & Engineering Co.: *See—*
Alexion, Dennis G.; and Storm, Fredrick P., Jr., 4,132,604, Cl. 203-87.000.
Caruso, Paul J.; and Kurth, William T., 4,132,570, Cl. 136-89.00P.
Coulaloglou, Costas A., 4,132,005, Cl. 34-10.000.
Gessler, Albert M.; and Kresge, Edward N., 4,132,698, Cl. 260-33.6AQ.
VanAuken, Richard L., 4,132,579, Cl. 156-189.000.

Fairchild Camera and Instrument Corporation: *See—*
Lake, Don W., 4,132,871, Cl. 179-84.0VF.

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Pachmayr, Frank A.; and Farrar, Jack R., 4,132,024, Cl. 42-71.00P.

Federal-Mogul Corporation: *See—*
Corsi, George L.; and Smith, Stanley N., 4,132,421, Cl. 277-166.000.
Ladin, Eli M., 4,132,105, Cl. 72-356.000.

Fein, Michael E.: *See—*
Byrum, Bernard W.; Ernsthausen, Roger E.; and Fein, Michael E., 4,132,982, Cl. 313-188.000.

Feistel, Gerald R.: *See—*
Choca, Monica E.; and Feistel, Gerald R., 4,132,669, Cl. 252-435.000.

Feldmuhle Aktiengesellschaft: *See—*
Dessauer, Guido; Leisner, Egon; and Rohr, Alfred, 4,132,826, Cl. 428-314.000.

Feldstein, Nathan. Method of applying dispersions for activating nonconductors for electroless plating and article. 4,132,832, Cl. 428-462.000.

Felicioli, Maria G.: *See—*
Bottaccio, Giorgio; Campolmi, Stefano; and Felicioli, Maria G., 4,132,732, Cl. 562-550.000.

Fenart, Jean-Claude, to Societe Anonyme Francaise du Ferodo. Diaphragm engagement means for expansible pulley. 4,132,120, Cl. 74-230.17A.

Feng, Joseph S., to International Business Machines Corporation. Digital measurement of the DC value in an AC signal adapted to telephone off-hook detection. 4,132,864, Cl. 179-18.0FA.

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Ferrarell, Michael J., to Buckingham Graphics, Inc. Film dryer. 4,132,013, Cl. 34-160.000.

Ferrentino, Antonio; Brovedan, Antonio; and Sala, Angelo, to Industrie Pirelli, S.p.A. Process for extruding plastomeric or elastomeric material on filaments. 4,132,756, Cl. 264-174.000.

Ferret, Francois; Doussoux, Pierre; and Le Nen, Yvon, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Device for the digital multiplexing of quasi-synchronous trains. 4,132,862, Cl. 179-15.0AF.

F'Geppert, Erwin, to United States of America, Army. Transmission synchronizer. 4,132,298, Cl. 192-53.00B.

Fiederer, Conrad: *See—*
Moore, Leonard W.; Bodle, Ronald L.; and Fiederer, Conrad, 4,133,022, Cl. 361-415.000.

Field, Donald E.; and Griffith, James R., to United States of America, Navy. Fluorinated polyether network polymers. 4,132,681, Cl. 260-836.000.

Filosa, Michael. Protective device for logs and log racks. 4,132,257, Cl. 150-52.00R.

Filzmoser, Ernst, to Von Roll AG. Process for the hygienic elimination of sewage containing salt-containing organic substances. 4,132,640, Cl. 210-68.000.

Finegold, Hyman B., to Globe Tool and Engineering Company, The. Method of manufacturing a dynamoelectric field member. 4,131,988, Cl. 29-596.000.

Finley, William S.: *See—*
Campbell, Joseph M.; and Finley, William S., 4,132,141, Cl. 84-115.000.

Firmenich SA: *See—*
Naf, Ferdinand, 4,132,675, Cl. 252-522.000.

Fisher, Robert M., to Programmable Systems, Inc. Video cassette changer-programmer. 4,133,013, Cl. 360-92.000.

Fisher, Robert P., to Maxi-Switch Company. Keyboard switch. 4,132,487, Cl. 400-479.100.

Fitch, James B., to General Signal Corporation. Liquid ring pump. 4,132,504, Cl. 417-68.000.

Fitts, John M., to Hughes Aircraft Company. Video correlation tracker. 4,133,004, Cl. 358-125.000.

Flanigan, William F.: *See—*
Seeley, Robert L.; and Flanigan, William F., 4,132,226, Cl. 128-2.10R.
Fleck, Raymond N.; and Hennig, Harvey, to Union Oil Company of California. Method of producing mechanical energy from geothermal brine. 4,132,075, Cl. 60-641.000.
Fleischer, Donald W., to Veeder Industries Inc. Counting system. 4,132,887, Cl. 235-92.0FL.
Flexi-Group Inc., The: *See—*
Bromberg, Howard M., 4,132,348, Cl. 229-75.000.
Flexsteel Industries, Inc.: *See—*
Quakenbush, Howard M., 4,131,960, Cl. 5-37.00R.
Flint, Thomas J.: *See—*
Lautner, Max E.; and Flint, Thomas J., 4,132,913, Cl. 310-68.00C.
Flores, Alfonso R.: *See—*
Lankenau, Henry G.; and Flores, Alfonso R., 4,132,587, Cl. 159-27.00A.
Flory, Robert E.; and Oakley, Charles B., to RCA Corporation. Raster registration system for a television camera. 4,133,003, Cl. 358-51.000.
FMC Corporation: *See—*
Craig, Fred A., 4,132,063, Cl. 59-7.000.
Key, William P.; Ihrig, David C.; and Monroe, Darrell W., 4,132,637, Cl. 210-7.000.
Folk, Kenneth F.; and Shatto, Walter C., Jr., to AMP Incorporated. Apparatus for deploying twisted wires. 4,132,251, Cl. 140-147.000.
Folser, George R.: *See—*
Buzzelli, Edward S.; and Folser, George R., 4,132,547, Cl. 75-211.000.
Fono, Andrew; and Patton, Ray F., to Royce Chemical Company. Control of dye migration in thermosol dyeing processes. 4,132,522, Cl. 8-17.000.
Ford, Michael A.; and Jackson, David, to Perkin-Elmer Limited. Cross-talk balancing circuit for spectrophotometers. 4,132,481, Cl. 356-325.000.
Forest Electric Company: *See—*
Schmutzer, Joel J.; and Elkerton, George D., 4,132,925, Cl. 315-208.000.
Formulette Co., Inc.: *See—*
Lerner, Robert, 4,132,232, Cl. 128-360.000.
Forrest, Charles D. Superfine PETN thin layer slurry explosive. 4,132,574, Cl. 149-2.000.
Foster, Gordon F.: *See—*
Eolin, Robert W.; Foster, Gordon F.; Mach, Joseph F.; and Maschmeyer, Richard O., 4,132,538, Cl. 65-32.000.
Four Star Corporation: *See—*
Ingram, Charles E., 4,132,335, Cl. 224-42.10F.
Fournier, Jean-Paul: *See—*
Moreau, Robert C.; and Fournier, Jean-Paul, 4,132,786, Cl. 424-228.000.
Fox Industries, Inc.: *See—*
Scheffel, Carl W., 4,132,491, Cl. 404-68.000.
Fox, Robert C., Jr. Shock absorber with improved extension damping. 4,132,395, Cl. 267-64.00R.
Frambach, Henry R., to Samson Industries, Inc. Insulated window assembly. 4,132,035, Cl. 49-484.000.
Francisco-Arnold, Richard D. Submarine conductor for the deep sea transmission of high voltage electrical power. 4,132,084, Cl. 405-171.000.
Frank, Robert I.: *See—*
Kaplow, Roy; and Frank, Robert I., 4,131,984, Cl. 29-572.000.
Frank, Wolfgang: *See—*
Kania, Sigmund; and Frank, Wolfgang, 4,132,158, Cl. 98-2.180.
Franke, Norman W.: *See—*
Barie, Walter P., Jr.; and Franke, Norman W., 4,132,697, Cl. 260-32.8EP.
Frankiewicz, Theodore C.; and Lueders, Robert E., to Kennecott Copper Corporation. Copper leaching employing nitrogen dioxide as oxidant. 4,132,758, Cl. 423-27.000.
Franklin Institute, The: *See—*
Haigh, Thomas I., 4,131,955, Cl. 2-246.000.
Frantz, John J., to General Electric Company. Variable double lip quiet inlet. 4,132,240, Cl. 137-15.100.
Frederick, Judson G.; Mercer, Benjamin, Jr.; and Poole, John E., to Owens-Illinois, Inc. Apparatus for coating a portion of a bottle. 4,132,191, Cl. 118-409.000.
Fredrick, William L. Apparatus and method for enhancing combustibility of solid fuels. 4,132,180, Cl. 110-244.000.
Freed, Donald J.: *See—*
Chandross, Edwin A.; and Freed, Donald J., 4,132,608, Cl. 204-27.000.
Frieder, Leonard P., Jr.; and Cochran, Benjamin T., to Gentex Corporation. Headset having double-coil earphone. 4,132,861, Cl. 179-1.00P.
Friedland, Bernard, to Singer Company, The. Feedback system for a ring laser gyro. 4,132,482, Cl. 356-350.000.
Frisen, Robert A., to International Telephone and Telegraph Corporation. Backflow prevention devices. 4,132,246, Cl. 137-536.000.
Froggatt, Robert J., to EMI Limited. Radiography. 4,132,895, Cl. 250-445.00T.
Frolov, Valery A.: *See—*
Gurevich, Vladimir Z.; Prashin, Anatoly A.; Stoyakin, Vyacheslav P.; Ter-Minosian, Sergei M.; Frolov, Valery A.; Tolstykh, Viktor S.; Bogansky, Vasily V.; and Ivanenko, Gennady V., 4,132,339, Cl. 228-103.000.
Frye Copysystems, Inc.: *See—*
Du, Elbert, 4,132,835, Cl. 428-522.000.
FSI Corporation: *See—*
Blackwood, Robert S., 4,132,567, Cl. 134-1.000.
Fugono, Takeshi: *See—*
Nomura, Hiroaki; Hitaka, Takenori; Akimoto, Hiroshi; Minami, Isao; Kiriki, Fumio; Matsuda, Tatsuichi; and Fugono, Takeshi, 4,132,789, Cl. 424-246.000.
Fuji Photo Film Co., Ltd.: *See—*
Hosoi, Noriyuki; Ogata, Yasuhiro; and Matsukawa, Hiroharu, 4,132,112, Cl. 73-141.00R.
Ishige, Sadao; Usui, Hideo; and Saeki, Keiso, 4,132,436, Cl. 282-27.500.
Kondo, Toshihiro, 4,132,888, Cl. 250-204.000.
Mukaida, Yoshito; Fujiyama, Masaaki; Komine, Shigeo; Igarashi, Masaaki; Yamaguchi, Nobutaka; Iida, Shinobu; and Kasuga, Akira, 4,132,827, Cl. 428-329.000.
Fuji Photo Optical Co., Ltd.: *See—*
Suzuki, Masane; and Suzuki, Kiyoshi, 4,132,575, Cl. 156-58.000.
Tobioka, Takashi, 4,132,467, Cl. 352-172.000.
Fujimori, Yoshiaki, to Kabushiki Kaisha Suwa Seikosha. Digital watch case. 4,132,062, Cl. 58-90.00R.
Fujimoto, Hideaki: *See—*
Nagano, Masashi; and Fujimoto, Hideaki, 4,132,119, Cl. 74-217.00B.
Fujimoto, Ryoichi: *See—*
Maio, Kenji; Inose, Fumiyuki; Yokozawa, Norio; Fujimoto, Ryoichi; and Takasugi, Kazuo, 4,132,085, Cl. 62-155.000.
Fujitsu Limited: *See—*
Buelow, Fred K.; Zasio, John J.; and Cooke, Laurence H., 4,132,898, Cl. 250-492.00A.
Yamaguchi, Hisashi; Murase, Kenji; Ishizaki, Hiroyuki; and Kashiwara, Hirofumi, 4,132,924, Cl. 340-779.000.
Fujiwara, Katsuji. Condensate discharge apparatus. 4,132,936, Cl. 318-482.000.
Fujiyama, Masaaki: *See—*
Mukaida, Yoshito; Fujiyama, Masaaki; Komine, Shigeo; Igarashi, Masaaki; Yamaguchi, Nobutaka; Iida, Shinobu; and Kasuga, Akira, 4,132,827, Cl. 428-329.000.
Fukazawa, Nobuo: *See—*
Aya, Masahiro; Fukazawa, Nobuo; Kurihara, Kazuo; and Kobori, Itsuro, 4,132,543, Cl. 71-88.000.
Fukube, Yoshito: *See—*
Nakamura, Kazuo; Fukube, Yoshito; and Osaki, Takashi, 4,132,828, Cl. 428-366.000.
Fulmer, Keith H., to Bendix Corporation, The. Brake pedal mechanism. 4,132,127, Cl. 74-512.000.
Funk, Stanley T., to Ortner Freight Car Company. Rapid discharging hopper car automatic door latch. 4,132,177, Cl. 105-310.000.
Furlong, Donn B., to Ecodyne Corporation. Plastic heat exchange tube. 4,132,264, Cl. 165-179.000.
G.L. Rexroth G.m.b.H.: *See—*
Dantlgraber, Jorg, 4,132,506, Cl. 417-218.000.
Gaddi, Bruno, to Piaggio & C. S.p.A. Drive wheel with an internal combustion engine housed in its interior. 4,132,281, Cl. 180-33.00C.
GAF Corporation: *See—*
Loprest, Frank J.; and McInerney, Eugene F., 4,132,549, Cl. 96-35.000.
Strobel, Albert F., 4,132,774, Cl. 424-60.000.
Verdicchio, Robert J.; and Nehmsmann, Louis J., III, 4,132,657, Cl. 252-32.500.
Gafarov, Palmir M.; Minkov, Jury V.; and Solomonenko, Vladimir I. Integrated semiconductor dynamic memory. 4,133,048, Cl. 365-208.000.
Gahler, Egon; and Dietrich, Rolf, to Braun Aktiengesellschaft. Circuit for light-integrator-controlled electronic flash unit. 4,132,923, Cl. 315-151.000.
Gaillard, Jean: *See—*
Amigues, Pierre; Gaillard, Jean; Le Page, Jean-Francois; and Stern, Robert, 4,132,745, Cl. 260-683.200.
Galanis, Tom L.: *See—*
Grohowski, Joseph A.; and Galanis, Tom L., 4,133,035, Cl. 364-472.000.
Galentan, A.G.: *See—*
Noz, Francis X., 4,132,617, Cl. 204-206.000.
Gambino, Richard J.: *See—*
Cuomo, Jerome J.; Gambino, Richard J.; and Harper, James M. E., 4,132,614, Cl. 204-192.0EC.
Garcea, Gianpaolo, to Alfa Romeo S.p.A. Postcombustion airflow regulating valve for internal combustion engines. 4,132,070, Cl. 60-290.000.
Garcia, Joe L.; Hu, Paul Y.; and Waller, Tracy N., to International Business Machines Corporation. Self adjusting tachometer. 4,132,890, Cl. 250-231.0SE.
Gariazzo, Michael C.; and Haynes, Leonard S., to United States of America, Navy. Failure-resistant pseudo-nonvolatile memory. 4,133,044, Cl. 365-78.000.
Garrett Corporation, The: *See—*
Kumm, Emerson L., 4,132,064, Cl. 60-39.140.
Garron, Carlos S., to C. S. G. Enterprises, Inc. Electric motor with permanent magnets combined with electromagnets. 4,132,911, Cl. 310-46.000.
GATX Tank Erection Corporation: *See—*
Heisterberg, Milton W., 4,132,532, Cl. 48-174.000.
Gauronski, John F.; and Havel, Thomas A., to Xerox Corporation. Copier document sensing and control system. 4,132,401, Cl. 271-245.000.
Gaus, Harry; Johnson, Jeffrey; Milutziki, Udo; and Schotte, Dietwald,

to Braun Aktiengesellschaft. Phonograph turntable control system. 4,132,935, Cl. 318-480.000.
Gauthier, Jean A.; Humber, Leslie G.; and Revesz, Clara, to Ayerst, McKenna and Harrison, Ltd. [2]Benzopyrano[3,4-c]pyridines and process therefor. 4,132,710, Cl. 546-63.000.
Gay, Leon L.; Hardy, Periam B.; and Hutchinson, Donald, to Beech Aircraft Corporation. Fuel-air type bomb. 4,132,169, Cl. 102-6.000.
Gay, Lewis L.: *See*—
Hardy, Periam B.; Gay, Lewis L.; and Husler, Edward L., 4,132,170, Cl. 102-6.000.
Gay, Michel M.: *See*—
Crochemore, Michel M.; and Gay, Michel M., 4,132,703, Cl. 260-45.80A.
Geisen, Karl: *See*—
Hitzel, Volker; Weyer, Rudi; Pfaff, Werner; and Geisen, Karl, 4,132,795, Cl. 424-266.000.
Gelbuda, William A.: *See*—
Mueller, Floyd F.; and Gelbuda, William A., 4,132,178, Cl. 108-144.000.
Gell, Harold A., Jr. Plastic pipe welding apparatus and method. 4,132,578, Cl. 156-158.000.
General Atomic Company: *See*—
Bokros, Jack C., 4,131,957, Cl. 3-1.910.
General Electric Company: *See*—
Anderson, Harry C.; MacKenzie, Burton T., Jr.; Prober, Maurice; and Singh, Nirmal, 4,132,858, Cl. 174-120.0SR.
Ashley, Eugene, 4,132,149, Cl. 89-1.704.
Baliga, B. Jayant, 4,132,996, Cl. 357-21.000.
Bochan, John, 4,132,709, Cl. 34-45.000.
Borman, Willem F. H., 4,132,707, Cl. 528-273.000.
Elsworth, Robert M., 4,132,641, Cl. 210-73.00R.
Frantz, John J., 4,132,240, Cl. 137-15.100.
Hanson, James M., 4,133,023, Cl. 362-11.000.
Hueschen, Robert E.; and Jens, Richard A., 4,132,916, Cl. 313-330.000.
Johnson, Thomas O., 4,132,440, Cl. 292-341.190.
Kimura, Shiro G.; Lavigne, Raymond G.; and Browall, Warella R., 4,132,824, Cl. 428-220.000.
Lee, Lawrence J., Jr., 4,132,360, Cl. 239-383.000.
Martin, Robert J., III, 4,132,953, Cl. 325-478.000.
Mitoff, Stephan P., 4,132,820, Cl. 428-65.000.
Weischedel, Richard C.; and Carp, Gerald, 4,132,947, Cl. 324-77.00A.
Yang, Kei-Hsiung; and DeLuca, John A., 4,132,962, Cl. 331-94.50F.
General Mills, Inc.: *See*—
Knutson, Richard K., 4,132,810, Cl. 426-104.000.
General Motors Corporation: *See*—
Greenstein, Eugene, 4,133,000, Cl. 357-46.000.
Johnson, Lauren L.; and Wilson, Robert J., 4,133,017, Cl. 361-42.000.
General Signal Corporation: *See*—
Fitch, James B., 4,132,504, Cl. 417-68.000.
Gjertsen, Leroy E., 4,132,188, Cl. 116-332.000.
General Time Corporation: *See*—
Hart, Robert D.; and Mazzamauro, Robert, 4,132,986, Cl. 340-373.000.
Vanderpoel, Cornelius, 4,132,873, Cl. 200-6.00R.
Gent, Ernest C.; and Watson, Stephen R., to A. E. Lenton (Wisbech) Limited. Article counting apparatus. 4,132,304, Cl. 198-432.000.
Gent, John A. G.: *See*—
Larsen, Hans-Ole; Barfoed, Sven; and Gent, John A. G., 4,132,683, Cl. 521-106.000.
Gentex Corporation: *See*—
Frieder, Leonard P., Jr.; and Cochran, Benjamin T., 4,132,861, Cl. 179-1.00P.
Gentili, Claudio, to Honeywell Information Systems Italia. Information refreshing system in a semiconductor memory. 4,133,051, Cl. 365-222.000.
Georg Fischer Aktiengesellschaft: *See*—
Baumann, Gerhard; Tanner, Hans; and Wuchner, Xaver, 4,132,495, Cl. 408-74.000.
Gerigk, Gunter; Bittner, Klaus-Jurgen; and Kostner, Armin, to Hoechst Aktiengesellschaft. Method of making sheathed tubular stick. 4,132,047, Cl. 53-396.000.
Germaine Monteil Cosmetiques Corp.: *See*—
Margolin, Herbert E., 4,132,306, Cl. 206-37.000.
Gesellschaft fur Strahlen- und Umweltforschung mbH Munchen: *See*—
Wittmaack, Klaus, 4,132,892, Cl. 250-309.000.
Gessler, Albert M.; and Kresge, Edward N., to Exxon Research & Engineering Co. Elastomeric thermoplastics. 4,132,698, Cl. 260-33.6AQ.
Ghys, Theofiel H.: *See*—
Pollet, Robert J.; Thiers, Robrecht J.; Ghys, Theofiel H.; Vandenberghe, Antoon L.; Philippaerts, Herman A.; and Vandenabeele, Hubert, 4,132,551, Cl. 96-66.500.
Giambrone, Harry J.: *See*—
Briggs, Eugene C.; Shaftner, Robert F.; and Giambrone, Harry J., 4,132,353, Cl. 236-10.000.
Giardino, Pietro: *See*—
Bernardi, Luigi; Giardino, Pietro; Patelli, Bianca; and Arcamone, Federico, 4,132,721, Cl. 260-365.000.
Gilbaut, Fernand: *See*—
Lechanu, Jacques; and Gilbaut, Fernand, 4,132,399, Cl. 277-47.000.
Gilbert, Neal J.; and Horton, Edward L., to Enviro-Blast International. Abrasive blasting apparatus. 4,132,039, Cl. 51-424.000.
Ginsberg, Kurt. Word game. 4,132,406, Cl. 273-1.00R.
Gist-Brocades N.V.: *See*—
van Os, Jan L.; Oldenkamp, Engbert P.; and Smink, Dirk A., 4,132,777, Cl. 424-119.000.
Giuffre, Luigi; Spaziante, Placido M.; Pozzi, Vittorio; and Modica, Giovanni, to Oronzio de Nora Impianti Elettrochimici S.p.A. Method of shaping an organic polymer insoluble in a polar solvent. 4,132,819, Cl. 427-341.000.
Giuliani, Gino: *See*—
Vargiu, Silvio; Pitzalis, Mario; Crespolini, Giancarlo; and Giuliani, Gino, 4,132,718, Cl. 260-348.150.
Givaudan Corporation: *See*—
Shaffer, Gary W.; and Purzycki, Kenneth L., 4,132,677, Cl. 252-522.000.
Virgilio, Joseph A., 4,132,676, Cl. 252-522.000.
Gjertsen, Leroy E., to General Signal Corporation. Device for securing elements to a tapered shaft. 4,132,188, Cl. 116-332.000.
GKN Transmissions Ltd.: *See*—
Sankey, Ivor G.; and Turner, Colin F. S., 4,132,422, Cl. 277-212.0FB.
Glaeser, George L., Jr.: *See*—
Painter, Alan; O'Neill, Daniel R.; and Glaeser, George L., Jr., 4,132,607, Cl. 204-9.000.
Glaxo Laboratories Limited: *See*—
Ayres, Barry E., 4,132,849, Cl. 544-28.000.
Glaze, John W., Jr., to Intech Corporation. Rotary tray former. 4,132,156, Cl. 93-51.100.
Glinert, Floyd, to Shorewood Packaging Corp. Tape cartridge/cassette receptacle. 4,132,311, Cl. 206-387.000.
Globe Tool and Engineering Company, The: *See*—
Finegold, Hyman B., 4,131,988, Cl. 29-596.000.
Glorioso, Paul A., to TRW Inc. Arc time indicating apparatus for stud welding utilizing a capacitive power source. 4,132,879, Cl. 219-98.000.
Glucksman, Dov Z.; and Weidemann, Karl H. Electric space heater. 4,132,885, Cl. 219-345.000.
Goettl, Adam D. Air conditioning assembly. 4,132,087, Cl. 62-285.000.
Gogua, Lia D.: *See*—
Gryaznov, Vladimir M.; Smirnov, Viktor S.; Vdovin, Valentin M.; Ermilova, Margarita M.; Gogua, Lia D.; Pritula, Nina A.; and Litvinov, Igor A., 4,132,668, Cl. 252-430.000.
Golay, Bernard; and Moulene, Daniel. Apparatus for the treatment of information in an optical form. 4,133,005, Cl. 358-132.000.
Goldstein, Jonathan R.: *See*—
Klein, Yitzchak; and Goldstein, Jonathan R., 4,132,619, Cl. 204-242.000.
Gomann, Rolf: *See*—
Greve, Heinz; Grumer, Peter; and Gomann, Rolf, 4,132,189, Cl. 118-8.000.
Gomberg, Henry J., to Texas Gas Transmission Corporation. Method and apparatus for the manufacture of methanol. 4,132,727, Cl. 260-449.500.
Goncalves, Antonin, to L'Oreal. Dispensing container for storing two products separately and dispensing them as a mixture. 4,132,308, Cl. 206-219.000.
Goodin, Richard D.: *See*—
Baizer, Manuel M.; Goodin, Richard D.; and Hallcher, Richard C., 4,132,611, Cl. 204-59.00R.
Goodyear Tire & Rubber Company, The: *See*—
Bhakuni, Roop S.; and Laske, Richard F., 4,132,693, Cl. 260-29.300.
Gorbik, Anatoly S.: *See*—
Andoniev, Sergei M.; Gritsuk, Lev D.; Gorbik, Anatoly S.; Kurganov, Viktor V.; Oleinik, Nikolai P.; Rivlin, Grigory I.; Stetsenko, Nikolai V.; Shamil, Jury P.; Smetanin, Jury G.; and Nesterenko, Petr S., 4,132,852, Cl. 13-32.000.
Gorlitz, Wolf-Dieter; and Broecker, Bernhard, to Hoechst Aktiengesellschaft. Aqueous coating agent for stoving based on aqueous dispersion of epoxide resin mixtures and epoxide curing agents, process for the manufacture thereof and the use thereof. 4,132,692, Cl. 260-29.2EP.
Gorman, Marvin; Higgens, Calvin E.; and Nagarajan, Ramakrishnan, to Eli Lilly and Company. Antibiotic A16886II. 4,132,790, Cl. 424-246.000.
Gosudarstvenny Universitet Imeni Petra Stuchki: *See*—
Rode, Oyars A.; Lusis, Andrei R.; Klyavin, Yanis K.; and Zamozdik, Talivaldis V., 4,132,465, Cl. 350-357.000.
Gould Inc.: *See*—
Clark, Robert M.; Cronin, John C.; Reighter, David H.; and Tahiliani, Vasu H., 4,132,855, Cl. 174-28.000.
Lautner, Max E.; and Flint, Thomas J., 4,132,913, Cl. 310-68.00C.
Gournay, Luke S.; Harrell, John W.; and Dennis, Charles L., to Mobile Oil Corporation. Remote sensing of hydrocarbon gas seeps utilizing microwave energy. 4,132,943, Cl. 324-6.000.
Graham, George W. Glueing clamp assembly. 4,132,396, Cl. 269-41.000.
Graham, Scott O., to RCA Corporation. CCD output circuit using thin film transistor. 4,132,903, Cl. 307-221.00D.
Grandia, William M., to Borg-Warner Corporation. Disconnect mechanism for compressor drive. 4,132,300, Cl. 192-82.00T.
Grandmaison, John P.: *See*—
Huettner, Robert E.; Grandmaison, John P.; Vernon, John H.; Lemay, Richard A.; and Beauchemin, Edward, 4,133,030, Cl. 364-200.000.
Granier, William: *See*—
Parant, Bernard; Cot, Louis; Granier, William; and Durand, Jean-Henri, 4,132,572, Cl. 148-6.15R.

Granitz, Richard F.: *See—*
Rose, William H.; and Granitz, Richard F., 4,131,982, Cl. 29-566.200.

Grass, Alfred. Reinforced hinge with adjustable tightening means. 4,131,968, Cl. 16-129.000.

Grassle, Alfred: *See—*
Wilfert, Thomas; Grassle, Alfred; and Peters, Klaus-Jurgen, 4,132,211, Cl. 123-179.00L.

Greatbatch, Wilson, to Eleanor & Wilson Greatbatch Foundation. Alkali metal-halogen cell having mixed halogen cathode. 4,132,836, Cl. 429-91.000.

Greber, Gerd: *See—*
Kvita, Vratislav; Darms, Roland; and Greber, Gerd, 4,132,716, Cl. 260-326.340.

Green, James A., to Rockwell International Corporation. Comfort support seat cushion assembly. 4,132,228, Cl. 128-33.000.

Green, Terrence A., to Arvin Industries, Inc. Interlocking pipe ball joint. 4,132,437, Cl. 285-263.000.

Greenstein, Eugene, to General Motors Corporation. Integrated circuit process compatible surge protection resistor. 4,133,000, Cl. 357-46.000.

Greenwood, John C.; and Young, John M., to ITT Industries, Inc. Thin silicon devices. 4,131,985, Cl. 29-580.000.

Greig, Margaret E., to Upjohn Company, The. Process of treating asthma. 4,132,804, Cl. 424-317.000.

Gress, Wolfgang: *See—*
Heyden, Rudi; Asbeck, Adolf; Eckelt, Michael; and Gress, Wolfgang, 4,132,694, Cl. 260-29.60R.

Greve, Heinz; Grumer, Peter; and Gomann, Rolf, to Hauni-Werke Korber & Co. KG. Apparatus for applying plasticizer to fibrous filter material in filter rod making machines. 4,132,189, Cl. 118-8.000.

Griffith, James R.: *See—*
Field, Donald E.; and Griffith, James R., 4,132,681, Cl. 260-836.000.

Grime, Thomas E., to Champion Spark Plug Company. Electric steam vaporizer. 4,132,883, Cl. 219-284.000.

Grimm, Eberhard: *See—*
Husges, Gerd; and Grimm, Eberhard, 4,132,056, Cl. 57-263.000.

Gritsuk, Lev D.: *See—*
Andoniev, Sergei M.; Gritsuk, Lev D.; Gorbik, Anatoly S.; Kurganov, Viktor V.; Oleinik, Nikolai P.; Rivlin, Grigory I.; Stetsenko, Nikolai V.; Shamil, Jury P.; Smetanin, Jury G.; and Nesterenko, Petr S., 4,132,852, Cl. 13-32.000.

Groeneweg, Abraham, to N.V. Optische Industrie "De Oude Delft". Monocular night glass with pivotable power unit. 4,132,889, Cl. 250-213.0VT.

Groeneweg, Willem H., to RCA Corporation. PAL identification circuit. 4,133,002, Cl. 358-18.000.

Grohowski, Joseph A.; and Galanis, Tom L., to Bethlehem Steel Corporation. Selectable coiling control method and apparatus. 4,133,035, Cl. 364-472.000.

Gross, Gerald G., to Liquid Xtal Displays Inc. Liquid crystal display. 4,132,984, Cl. 350-336.000.

Gross, Jacob S. Domestic cleaning device. 4,131,966, Cl. 15-28.000.

Grosskopf, Peter V. Refrigerating machine in flat unit construction. 4,132,088, Cl. 62-298.000.

Grotness, Gunnar; and Boyer, Peter W., to PHD, Inc. Metering control valve and fluid power system. 4,132,153, Cl. 91-405.000.

Grove, John L., to JLG Industries, Inc. Multi-section lifting boom. 4,132,040, Cl. 52-115.000.

Grozier, Robert A.: *See—*
Rauscher, Dean C.; Grozier, Robert A.; and Rauscher, Frank J., 4,132,330, Cl. 222-76.000.

Grumer, Peter: *See—*
Greve, Heinz; Grumer, Peter; and Gomann, Rolf, 4,132,189, Cl. 118-8.000.

Gryaznov, Vladimir M.; Smirnov, Viktor S.; Vdovin, Valentin M.; Ermilova, Margarita M.; Gogua, Lia D.; Pritula, Nina A.; and Litvinov, Igor A. Method of preparing a hydrogen-permeable membrane catalyst on a base of palladium or its alloys for the hydrogenation of unsaturated organic compounds. 4,132,668, Cl. 252-430.000.

Gryctko, Carl E., to I-T-E Imperial Corporation. Unitized combination starter. 4,132,967, Cl. 335-11.000.

GTE Sylvania Incorporated: *See—*
Deschenes, Charles E.; and Ingalls, Jeffrey D., 4,132,004, Cl. 33-366.000.

Gubin, Sergei P.: *See—*
Nametkin, Nikolai S.; Matveev, Mikhail S.; Gubin, Sergei P.; Dekhterman, Abram S.; Tjurin, Vladimir D.; Skibenko, Anatoly P.; Orlova, Valentina S.; Savenko, Alevtina I.; and Podolskaya, Irina P., 4,132,631, Cl. 208-236.000.

Guibert, Raul. Two-zone hot air oven for food-loaded cartridges. 4,132,216, Cl. 126-261.000.

Gulf Research & Development Company: *See—*
Barie, Walter P., Jr.; and Franke, Norman W., 4,132,697, Cl. 260-32.8EP.
Carr, Norman L.; and McGinnis, Edgar L., 4,132,630, Cl. 208-177.000.
Heilman, William J.; and Lynch, Thomas J., 4,132,663, Cl. 252-59.000.

Gurevich, Vladimir Z.; Prashin, Anatoly A.; Stoyakin, Vyacheslav P.; Ter-Minosian, Sergei M.; Frolov, Valery A.; Tolstykh, Viktor S.; Bogansky, Vasily V.; and Ivanenko, Gennady V., to Vsesojuzny Proektno-Konstruktorsky Tekhnologichesky Institut Atomnogo Mashinostroenia; and Taganrogsky Zavod Krasny Kotelschik. Method of making pipe strings and automatic line for realizing same. 4,132,339, Cl. 228-103.000.

Gutierrez, Louis F.: *See—*
Khoja, Mirza A.; Gutierrez, Louis F.; and Perone, John T., 4,132,349, Cl. 233-25.000.

Gutjahr, Manfred A.: *See—*
Crespy, Guy; Matthey, Pierre; and Gutjahr, Manfred A., 4,132,606, Cl. 204-2.100.

Guymer, Barry R., to Schlegel (UK) Limited. Deadlock latch. 4,132,438, Cl. 292-111.000.

Guzik, Frederick F., to PPG Industries, Inc. S-p-methoxyphenyl N,N-diallylthiolcarbamate and S-p-methoxyphenyl N,N-bis(2,3-dibromopropyl)thiolcarbamate. 4,132,800, Cl. 424-300.000.

H. B. Fuller Company: *See—*
Juba, Bernard T., 4,132,043, Cl. 52-309.170.

H. Krantz GmbH & Co.: *See—*
Schiffers, Theo, 4,131,977, Cl. 26-91.000.

Haag, Franz: *See—*
Bongartz, Paul; and Haag, Franz, 4,132,509, Cl. 417-475.000.

Haber, George J.; Tan, Chee T.; and Wu, Joanna, to International Flavors & Fragrances Inc. Stable red beet color composition. 4,132,793, Cl. 426-250.000.

Hahn, Hans-Jurgen, to Messerschmitt-Bolkow-Blohm GmbH. Composite structural member, especially for dynamic loads. 4,132,825, Cl. 428-311.000.

Haigh, Thomas I., to Franklin Institute, The. Garment emblem. 4,131,955, Cl. 2-246.000.

Haji, Takashi: *See—*
Nakamura, Shoji; Nakamoto, Yasuyuki; Yamamoto, Youshun; Matsufuji, Akira; Haji, Takashi; and Nakama, Akihiro, 4,132,393, Cl. 266-117.000.

Halberg, Robert W.: *See—*
Brown, Richard T.; Halberg, Robert W.; Simmons, John P.; and Holdeman, John W., 4,132,297, Cl. 192-36.000.

Hallberg, Torsten R.: *See—*
Dellrud, Rolf L.; and Hallberg, Torsten R., 4,132,159, Cl. 98-42.00R.

Hallcher, Richard C.: *See—*
Baizer, Manuel M.; Goodin, Richard D.; and Hallcher, Richard C., 4,132,611, Cl. 204-59.00R.

Halmai, Karoly: *See—*
Kiss, Laszlo; Csillag, Laszlo; Halmai, Karoly; and Miskolczi, Laszlo, 4,132,910, Cl. 310-12.000.

Hamill, Robert L.; and Hoehn, Marvin M., to Eli Lilly and Company. Antibiotic A-32887. 4,132,778, Cl. 424-121.000.

Hammonds, James C.: *See—*
Van Dyke, Ronald D.; Hammonds, James C.; and Stoller, Patricia S., 4,132,327, Cl. 220-244.000.

Hampel, Daniel, to RCA Corporation. Multi-function logic gate with one gate delay. 4,133,040, Cl. 364-773.000.

Hanawa, Akio; Miyamura, Noriyuki; and Oosugi, Yasuhiro, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Jet-stream control combustion engine. 4,132,197, Cl. 123-75.00B.

Hanes Corporation: *See—*
King, J. Frank; and Sloan, Donald A., 4,131,979, Cl. 29-2.190.

Hansen, Glen D., to Veda, Inc. Silo unloader lift attachment. 4,132,450, Cl. 302-56.000.

Hansen, Roger M., to Stratabolt Corporation. Resin anchored rock or mine roof bolt anchor mechanism. 4,132,080, Cl. 405-261.000.

Hanson, James M., to General Electric Company. Flash lamp array having electrical shield. 4,133,023, Cl. 362-11.000.

Harari, Eliyahou, to Hughes Aircraft Company. Volatile/non-volatile logic latch circuit. 4,132,904, Cl. 307-238.000.

Hardwick, Frank: *See—*
Bannister, Richard N.; and Hardwick, Frank, 4,132,699, Cl. 260-38.000.

Hardy, Periam B.; Gay, Lewis L.; and Husler, Edward L., to Beech Aircraft Corporation. Fuel-air type bomb. 4,132,170, Cl. 102-6.000.

Hardy, Periam B.: *See—*
Gay, Leon L.; Hardy, Periam B.; and Hutchinson, Donald, 4,132,169, Cl. 102-6.000.

Harmony Emitter Company, Inc.: *See—*
Harmony, Richard C., 4,132,364, Cl. 239-542.000.

Harmony, Richard C., to Harmony Emitter Company, Inc. Casing mounted emitter. 4,132,364, Cl. 239-542.000.

Harper, James M. E.: *See—*
Cuomo, Jerome J.; Gambino, Richard J.; and Harper, James M. E., 4,132,614, Cl. 204-192.0EC.

Harr, Ewald. Piston power generating and working machine. 4,132,118, Cl. 74-44.000.

Harrell, John W.: *See—*
Gournay, Luke S.; Harrell, John W.; and Dennis, Charles L., 4,132,943, Cl. 324-6.000.

Harrington, David E.: *See—*
DePablo, Raul S.; Harrington, David E.; and Bramstedt, William R., 4,132,569, Cl. 134-3.000.

Harris, Richard D.: *See—*
Bowlby, Paul D.; Cinkoske, James M.; and Harris, Richard D., 4,132,321, Cl. 214-6.0DK.

Harrison, Robert J., deceased (by Shannon, Carmen H., executrix), to Texaco Inc. Method for insuring oil well treatment on a regular basis as scheduled. 4,132,268, Cl. 166-244.00C.

Harrison, Ronald G. Dispenser for plastic cards. 4,132,329, Cl. 221-45.000.

Hart, Robert D.; and Mazzamauro, Robert, to General Time Corporation. Electromagnetic indicator. 4,132,986, Cl. 340-373.000.

Hartlaub, Jerome T., to Medtronic, Inc. Digital cardiac pacer. 4,132,233, Cl. 128-419.0PG.

Harvey, Donald M., to Eastman Kodak Company. Apparatus for selectively viewing a plurality of recording elements. 4,132,469, Cl. 353-25.000.
Hasha, Malvern M. Leak testing method and apparatus for tubular members packer means therefor. 4,132,111, Cl. 73-46.000.
Hashimoto, Teruo: *See*—
Iwase, Toshio; Hashimoto, Teruo; and Iguchi, Youko, 4,132,636, Cl. 210-6.000.
Hashimoto, Tohru; Kawarada, Akira; and Tamura, Sachiko, to Rikagaku Kenkyusho. Plant growth modifier and a process for preparation thereof. 4,132,541, Cl. 71-76.000.
Hasselschwert, Clifford L., to Indoor Billboard Corporation. Method for washing rugs and the like. 4,132,524, Cl. 8-151.000.
Hassler, Hedvig E. B.: *See*—
Kihlstedt, Per G.; and Hassler, Hedvig E. B., 4,132,559, Cl. 106-117.000.
Hasui, Hiroshi; and Suyama, Eizo, to Nihon Radiator Co., Ltd. Muffler. 4,132,286, Cl. 181-265.000.
Hatakeyama, Kazumi: *See*—
Sunami, Teruo; Morishita, Tsuyoshi; and Hatakeyama, Kazumi, 4,132,419, Cl. 277-96.200.
Hatayama, Shunichi; and Sakai, Masao, to Hitachi, Ltd. Megnetrons getter. 4,132,921, Cl. 315-39.510.
Hauni-Werke Korber & Co. KG.: *See*—
Erdmann, Otto; Deutsch, Reinhard; Symmanek, Horst; and Rudszinat, Willy, 4,132,398, Cl. 271-9.000.
Greve, Heinz; Grumer, Peter; and Gomann, Rolf, 4,132,189, Cl. 118-8.000.
Hausler, Michael, to BBC, Aktiengesellschaft Brown, Boveri & Cie. Method of starting up a high-voltage d-c inverter or transmission station in isolated or island operation. 4,133,026, Cl. 363-49.000.
Havel, Thomas A.: *See*—
Gauronski, John F.; and Havel, Thomas A., 4,132,401, Cl. 271-245.000.
Hawker, Fred D.: *See*—
Berenschot, Donald J.; Anders, Dale F.; and Hawker, Fred D., 4,132,688, Cl. 260-22.0CB.
Hawkins, Paul M.: *See*—
Manske, Wendell J.; and Hawkins, Paul M., 4,132,186, Cl. 116-216.000.
Hayashi, Shizuo: *See*—
Iijima, Eiji; Watanabe, Hiroshi; and Hayashi, Shizuo, 4,132,678, Cl. 252-545.000.
Tsutsumi, Hisao; Watanabe, Hiroshi; and Hayashi, Shizuo, 4,132,679, Cl. 252-545.000.
Haynes, Leonard S.: *See*—
Gariazzo, Michael C.; and Haynes, Leonard S., 4,133,044, Cl. 365-78.000.
Hebeda, Ronald E.; Holik, Dennis J.; and Leach, Harry W., to CPC International Inc. Dextrose production with immobilized glucoamylase. 4,132,595, Cl. 195-31.00R.
Heckler & Koch GmbH: *See*—
Weldle, Helmut, 4,132,023, Cl. 42-7.000.
Heemstra, Theodore C. Tufting machine. 4,132,182, Cl. 112-79.00R.
Heeren, Richard H., to Teletype Corporation. Method and apparatus for controlling a programmable logic array. 4,132,979, Cl. 340-147.00P.
Heilman, William J.; and Lynch, Thomas J., to Gulf Research & Development Company. Mineral oil compositions having improved pour point containing alpha-olefin copolymers. 4,132,663, Cl. 252-59.000.
Heimburg, Richard W.; and Stewart, Donald M. Burning apparatus. 4,132,179, Cl. 110-211.000.
Heiniger, Richard: *See*—
Smith, Donald D.; Davis, Otis L., III; and Heiniger, Richard, 4,132,181, Cl. 111-7.000.
Heinze, Walter O.: *See*—
Albertassi, James H.; and Heinze, Walter O., 4,131,959, Cl. 4-319.000.
Heisterberg, Milton W., to GATX Tank Erection Corporation. Multi-lift dry seal gasholder. 4,132,532, Cl. 48-174.000.
Hekimian Laboratories, Inc.: *See*—
Hekimian, Norris C.; and Kim, Chong-Soo, 4,132,957, Cl. 330-51.000.
Hekimian, Norris C.; and Kim, Chong-Soo, to Hekimian Laboratories, Inc. Programmable amplifier. 4,132,957, Cl. 330-51.000.
Hellqvist, Ake O. V. Sludge and slime separating and settling device. 4,132,643, Cl. 210-84.000.
Hellrung, Gunter: *See*—
Cramm, Gunther; Kranz, Eckart; and Hellrung, Gunter, 4,132,736, Cl. 260-552.0SC.
Helwig, Emmy. Device and process for separating the liquid part from the solid part of seeds and fruit. 4,132,161, Cl. 99-472.000.
Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA): *See*—
Heyden, Rudi; Asbeck, Adolf; Eckelt, Michael; and Gress, Wolfgang, 4,132,694, Cl. 260-29.60R.
Hennig, Harvey: *See*—
Fleck, Raymond N.; and Hennig, Harvey, 4,132,075, Cl. 60-641.000.
Hercules Incorporated: *See*—
Mollere, John C., 4,132,974, Cl. 340-7.00R.
Hermer, Gerald P.: *See*—
Bolton, Colin B.; and Hermer, Gerald P., 4,131,974, Cl. 9-337.000.
Herr, Charles H., Jr.: *See*—
Avery, Bennett W.; Herr, Charles H., Jr.; and Lamport, Ivan R., 4,132,134, Cl. 74-801.000.
Hertz, Martin R.; and Martin, John H. E. J., to American Cyanamid Company. Antibiotic BL580 Zeta and use thereof as anticoccidial agent. 4,132,779, Cl. 424-122.000.
Hess, Ernst P., to Qume Corporation. Ink ribbon cartridge with constant tension mechanism. 4,132,485, Cl. 400-208.000.
Hesston Corporation: *See*—
White, Allen A., 4,132,163, Cl. 100-42.000.
White, Allen A., 4,132,164, Cl. 100-189.000.
Hewlett-Packard GmbH: *See*—
Zeeb, Helmut E., 4,132,116, Cl. 73-362.0AR.
Heyden, Rudi; Asbeck, Adolf; Eckelt, Michael; and Gress, Wolfgang, to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA). Method for improving the latent glass of latex paints. 4,132,694, Cl. 260-29.60R.
Heyek, Walter: *See*—
Wegner, John F.; and Heyek, Walter, 4,132,019, Cl. 40-349.000.
Hickerson, Robert J.: *See*—
Scott, Irvin C.; Settle, Evan E., III; and Hickerson, Robert J., 4,131,981, Cl. 29-505.000.
Hicks, Alan A.; and Disko, Harry, to Marvin Glass & Associates. Paper craft kit. 4,132,155, Cl. 93-1.00G.
Hicks, Alan A.: *See*—
Breslow, Jeffrey D.; and Hicks, Alan A., 4,132,411, Cl. 273-119.00R.
Hideki Ishii: *See*—
Maeno, Jun, 4,132,464, Cl. 350-351.000.
Hiers, John J.; and Wald, Stephen A., to Scott Chatham Company. Textile fabric with leather-like appearance. 4,132,821, Cl. 428-151.000.
Higgens, Calvin E.: *See*—
Gorman, Marvin; Higgens, Calvin E.; and Nagarajan, Ramakrishnan, 4,132,790, Cl. 424-246.000.
Hilberman, Dan, to Bell Telephone Laboratories, Incorporated. Single amplifier frequency dependent negative resistor. 4,132,966, Cl. 333-80.00R.
Hills-McCanna Company: *See*—
Priese, Werner K.; and Koehlert, Charles I., 4,132,071, Cl. 60-328.000.
Hillyard, Peter T., to Lucas Industries Limited. Ignition coils. 4,132,969, Cl. 336-94.000.
Hilti Aktiengesellschaft: *See*—
Uhlig, Raimer, 4,132,146, Cl. 85-33.000.
Hipkin, Frank: *See*—
Johnson, Keith; and Hipkin, Frank, 4,132,394, Cl. 266-138.000.
Hirano, Kiyoshige: *See*—
Kobayakawa, Masaki; Yawata, Kazufumi; Hirano, Kiyoshige; and Yamashita, Shigeru, 4,132,920, Cl. 313-497.000.
Hiroshima, Minoru; Yoshizawa, Shigeru; Saito, Nobuo; Asano, Atsushi; Suehiro, Hiroshi; Saitoh, Minoru; and Mise, Keisuke, to Hitachi, Ltd.; and Nippon Telegraph and Telephone Public Corporation. Shift register type memory. 4,133,043, Cl. 365-15.000.
Hiscutt, Robert: *See*—
King, Robert D.; and Hiscutt, Robert, 4,132,624, Cl. 204-298.000.
Hitachi Heating Appliances Co., Ltd.: *See*—
Tachikawa, Hajime; Satoh, Kenji; and Watanabe, Mitsuru, 4,132,878, Cl. 219-10.55B.
Hitachi, Ltd.: *See*—
Hatayama, Shunichi; and Sakai, Masao, 4,132,921, Cl. 315-39.510.
Hiroshima, Minoru; Yoshizawa, Shigeru; Saito, Nobuo; Asano, Atsushi; Suehiro, Hiroshi; Saitoh, Minoru; and Mise, Keisuke, 4,133,043, Cl. 365-15.000.
Kameyama, Masayoshi; Horiguchi, Hiroshi; and Ichino, Kazuo, 4,132,939, Cl. 318-627.000.
Kuroiwa, Hiroshi; Nishimura, Yutaka; Ohyama, Yoshishige; and Nishimiya, Torazo, 4,132,199, Cl. 123-119.0EC.
Maio, Kenji; Inose, Fumiyuki; Yokozawa, Norio; Fujimoto, Ryoichi; and Takasugi, Kazuo, 4,132,085, Cl. 62-155.000.
Masuda, Hiroo; Kubo, Masaharu; and Hori, Ryoichi, 4,132,997, Cl. 357-23.000.
Okuyama, Toshiaki; Kubota, Yuzuru; and Nagase, Hiroshi, 4,132,931, Cl. 318-732.000.
Sato, Minoru; Takahashi, Isao; Kurasawa, Takanao; Yoshioka, Yoshio; and Nakagawa, Yukio, 4,132,876, Cl. 200-148.00A.
Terunuma, Mutsuhiro; Shima, Seiya; Tashiro, Korefumi; Ando, Takeki; Inaba, Hiromi; Kurosawa, Toshiaki; and Kuroha, Hiroaki, 4,133,018, Cl. 361-87.000.
Hitaka, Takenori: *See*—
Nomura, Hiroaki; Hitaka, Takenori; Akimoto, Hiroshi; Minami, Isao; Kiriki, Fumio; Matsuda, Tatsuichi; and Fugono, Takeshi, 4,132,789, Cl. 424-246.000.
Hitzel, Volker; Weyer, Rudi; Pfaff, Werner; and Geisen, Karl, to Hoechst Aktiengesellschaft. Benzenesulfonyl ureas and their use for the treatment of diabetes mellitus. 4,132,795, Cl. 424-266.000.
Ho, Winston: *See*—
Mohrbacher, Richard J.; Ho, Winston; and Tutwiler, Gene F., 4,132,719, Cl. 260-348.480.
Mohrbacher, Richard J.; Ho, Winston; and Tutwiler, Gene F., 4,132,720, Cl. 260-348.610.
Hochfelsen, Jerrold J., to Stedman, Cresswell E., Jr., a part interest. Article-carrying case and attaching and article-supporting hinge unit therefor. 4,132,295, Cl. 190-60.000.
Hodgson, William S., to South Shore Machine Company, Inc. Label applicator. 4,132,583, Cl. 156-351.000.
Hoechst Aktiengesellschaft: *See*—
Dalibor, Horst, 4,132,843, Cl. 528-45.000.
Fernholz, Hans; Schmidt, Hans-Joachim; and Wunder, Friedrich, 4,132,733, Cl. 562-601.000.

Gerigk, Gunter; Bittner, Klaus-Jurgen; and Kostner, Armin, 4,132,047, Cl. 53-396.000.
Gorlitz, Wolf-Dieter; and Broecker, Bernhard, 4,132,692, Cl. 260-29.2EP.
Hitzel, Volker; Weyer, Rudi; Pfaff, Werner; and Geisen, Karl, 4,132,795, Cl. 424-266.000.
Moraw, Roland; and Schadlich, Gunther, 4,132,893, Cl. 250-315.00A.
Ong, Sienling, 4,132,523, Cl. 8-21.00R.
Scholz, Manfred; Kaiser, Karl; and Semmler, Horst, 4,132,006, Cl. 34-10.000.

Hoehn, Marvin M.: *See*—
Hamill, Robert L.; and Hoehn, Marvin M., 4,132,778, Cl. 424-121.000.

Hofer, Bruce E.: *See*—
Addis, John L.; and Hofer, Bruce E., 4,132,958, Cl. 330-252.000.

Hofer, Johann: *See*—
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Koplin, Eckhard; Hoffmann, Horst; Raiff, Siegfried; Richter, Peter; and Kaufmann, Helmut, 4,132,235, Cl. 134-99.000.

Hoffmann-La Roche Inc.: *See*—
Pawson, Beverly A., 4,132,723, Cl. 260-404.000.

Hogan, James A., to Honeywell Inc. Process control system with backup process controller. 4,133,027, Cl. 364-119.000.

Hogenhout, Franciscus, to Boeing Company, The. Ram assembly for electromagnetic high energy impact apparatus. 4,132,108, Cl. 72-430.000.

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Milde, Wilhelm; and Hoheisel, Gerhard, 4,132,285, Cl. 181-258.000.

Holbrook, Leon G.: *See*—
Hutchins, Ned M.; Enyeart, J. Walter; and Holbrook, Leon G., 4,132,172, Cl. 102-30.000.

Holdeman, John W.: *See*—
Brown, Richard T.; Halberg, Robert W.; Simmons, John P.; and Holdeman, John W., 4,132,297, Cl. 192-36.000.

Holdren, Earl J.; Polasek, Peter; and Krzys, Thaddeus W., Jr., to Chrysler Corporation. Digital readout test probe. 4,132,946, Cl. 324-73.00R.

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Hebeda, Ronald E.; Holik, Dennis J.; and Leach, Harry W., 4,132,595, Cl. 195-31.00R.

Holland, Warren E., to Exxon Production Research Company. Method for protection of well equipment from particles of debris. 4,132,270, Cl. 166-314.000.

Holloway, Gale A.; Lark, Wayne W.; McLaughlin, Phillip M.; and Mortonson, Robert M., to International Harvester Company. Tractor hitch position control system. 4,132,272, Cl. 172-2.000.

Holloway, Gale A.: *See*—
Mortonson, Robert M.; and Holloway, Gale A., 4,132,273, Cl. 172-2.000.

Holt, Frederick S.: *See*—
Blacksmith, Philipp; Poirier, J. Leon; and Holt, Frederick S., 4,132,988, Cl. 340-552.000.

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Gentili, Claudio, 4,133,051, Cl. 365-222.000.

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Hooker Chemicals & Plastics Corp.: *See*—
Kenney, Edward J., 4,132,622, Cl. 204-268.000.

Hooper, Harry, to C-R-O, Inc. Metal cutting machine with movable torch feeding system. 4,132,392, Cl. 266-69.000.

Hoover Universal, Inc.: *See*—
Kitchen, John P., 4,131,961, Cl. 5-247.000.

Hori, Ryoichi: *See*—
Masuda, Hiroo; Kubo, Masaharu; and Hori, Ryoichi, 4,132,997, Cl. 357-23.000.

Horiguchi, Hiroshi: *See*—
Kameyama, Masayoshi; Horiguchi, Hiroshi; and Ichino, Kazuo, 4,132,939, Cl. 318-627.000.

Horton, Edward L.: *See*—
Gilbert, Neal J.; and Horton, Edward L., 4,132,039, Cl. 51-424.000.

Hosaka, Akio: *See*—
Asano, Masaharu; Aono, Shigeo; Hosaka, Akio; Ochiai, Kokichi; and Yamane, Michiyoshi, 4,132,200, Cl. 123-119.0EC.

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Benemann, Annelie; Schult, Norbert; Voj, Peter; and Hosemann, Bernhard, 4,132,115, Cl. 73-349.000.

Hosoi, Noriyuki; Ogata, Yasuhiro; and Matsukawa, Hiroharu, to Fuji Photo Film Co., Ltd. Pressure-measuring sheet. 4,132,112, Cl. 73-141.00R.

Hosoi, Ryosuke. Ball end mill. 4,132,493, Cl. 407-53.000.

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Ohta, Yoshiharu; and Hosomizu, Hiroshi, 4,132,926, Cl. 315-241.00P.

Hottel, Hoyt C., Jr.; Brown, Robert A.; Moore, Randall W.; and Sullivan, Paul F., to Acushnet Company. Filamentary projection system. 4,132,462, Cl. 350-117.000.

Hotten, Bruce W., to Chevron Research Company. Sulfur and chlorine-containing lubricating oil additive. 4,132,659, Cl. 252-48.800.

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Burke, Oliver W., Jr., deceased; and Humphreys, Victor T., 4,132,563, Cl. 106-308.00M.
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Hu, Paul Y.: *See*—
Garcia, Joe L.; Hu, Paul Y.; and Waller, Tracy N., 4,132,890, Cl. 250-231.0SE.

Huber, Franz: *See*—
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Hudis, Martin: *See*—
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Hughes Aircraft Company: *See*—
Fitts, John M., 4,133,004, Cl. 358-125.000.
Harari, Eliyahou, 4,132,904, Cl. 307-238.000.

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Hughes, Bill B., to Smiths Industries, Inc. Digital-to-analog conversion with deglitch. 4,132,908, Cl. 307-353.000.

Hughes, Helen: *See*—
Hughes, John L., 4,132,955, Cl. 330-4.300.

Hughes, John L., to Hughes, Helen. System for amplifying laser beams. 4,132,955, Cl. 330-4.300.

Hughes, Terence P. Decorative plague and multiple-purpose hanger and stand therefor. 4,132,018, Cl. 40-152.100.

Hugl, Herbert; and Wolfrum, Gerhard, to Bayer Aktiengesellschaft. Process for coloring polyurethane foams. 4,132,840, Cl. 521-167.000.

Humber, Leslie G.: *See*—
Gauthier, Jean A.; Humber, Leslie G.; and Revesz, Clara, 4,132,710, Cl. 546-63.000.
Santroch, George; and Humber, Leslie G., 4,132,709, Cl. 546-89.000.

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Hunkar, Denes B.; and Ortlepp, Hans, to Hunkar Laboratories, Inc. Closed loop electro-fluidic control system. 4,132,152, Cl. 91-364.000.

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Hunkele, Harry J.: *See*—
Chappelow, Ronald E.; and Hunkele, Harry J., 4,132,818, Cl. 427-248.00R.

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Husler, Edward L.: *See*—
Hardy, Periam B.; Gay, Lewis L.; and Husler, Edward L., 4,132,170, Cl. 102-6.000.

Hussey, David C., to Bertea Corporation. Ratio select mechanism. 4,132,126, Cl. 74-479.000.

Hutchins, Ned M.; Enyeart, J. Walter; and Holbrook, Leon G., to Occidental Oil Shale, Inc. Hinged bridging plug for explosive placement holes. 4,132,172, Cl. 102-30.000.

Hutchinson, Donald: *See*—
Gay, Leon L.; Hardy, Periam B.; and Hutchinson, Donald, 4,132,169, Cl. 102-6.000.

Hutchison, Robert V.; and Nelson, John A., to Burroughs Corporation. Process of forming a plastic encapsulated molded film carrier CML package and the package formed thereby. 4,132,856, Cl. 174-52.0PE.

Hwang, Mei H., to Calgon Corporation. Electroconductive coating formulation. 4,132,674, Cl. 252-500.000.

Hyde, Paul E.; and Miller, Russell N., to Neptune Microfloc, Inc. Spray head. 4,132,362, Cl. 239-453.000.

Hynson, Westcott & Dunning, Inc.: *See*—
Whattam, George F., 4,132,225, Cl. 1 28-2.00F.

Hyogo Prefectural Government: *See*—
Dohi, Nobuyasu; and Obata, Keigo, 4,132,610, Cl. 204-43.00S.

I-T-E Imperial Corporation: *See*—
Gryctko, Carl E., 4,132,967, Cl. 335-11.000.

Iannelli, Frank M., to Tannetics, Inc. Flow control device. 4,132,241, Cl. 137-102.000.
Ibe, Wolfgang, to Winter & Ibe. Urological endoscope particularly resectoscope. 4,132,227, Cl. 128-4.000.
ICESLJ AG: *See*—
Olivieri, Icaro, 4,132,424, Cl. 280-11.300.
Ichino, Kazuo: *See*—
Kameyama, Masayoshi; Horiguchi, Hiroshi; and Ichino, Kazuo, 4,132,939, Cl. 318-627.000.
ICI Americas Inc.: *See*—
Rutledge, Thomas F., 4,132,722, Cl. 260-396.00N.
Ida, Shuichiro: *See*—
Ishii, Hakumi; Sogo, Yoshitaka; and Ida, Shuichiro, 4,132,123, Cl. 74-473.0SW.
Igarashi, Masaaki: *See*—
Mukaida, Yoshito; Fujiyama, Masaaki; Komine, Shigeo; Igarashi, Masaaki; Yamaguchi, Nobutaka; Iida, Shinobu; and Kasuga, Akira, 4,132,827, Cl. 428-329.000.
Igel, Wolfgang: *See*—
Weiss, Helmut; Kraft, Harald; and Igel, Wolfgang, 4,132,057, Cl. 57-261.000.
Igra, Ozer, to Ben Gurion University of the Negev. Wind driven energy generating device. 4,132,499, Cl. 415-2.000.
Iguchi, Youko: *See*—
Iwase, Toshio; Hashimoto, Teruo; and Iguchi, Youko, 4,132,636, Cl. 210-6.000.
Ihrig, David C.: *See*—
Key, William P.; Ihrig, David C.; and Monroe, Darrell W., 4,132,637, Cl. 210-7.000.
Iida, Hiroshi, to Manno Kogyo Company, Limited. Shift mechanism for automotive transmission. 4,132,124, Cl. 74-473.00R.
Iida, Shinobu: *See*—
Mukaida, Yoshito; Fujiyama, Masaaki; Komine, Shigeo; Igarashi, Masaaki; Yamaguchi, Nobutaka; Iida, Shinobu; and Kasuga, Akira, 4,132,827, Cl. 428-329.000.
Iijima, Eiji; Watanabe, Hiroshi; and Hayashi, Shizuo, to Kao Soap Co., Ltd. Transparent liquid shampoo. 4,132,678, Cl. 252-545.000.
Iinuma, Kazumoto, to Nippon Electric Co., Ltd. Predictive encoder or decoder with selection of one of two or more prediction signals according to prediction error signal amplitudes. 4,133,006, Cl. 358-133.000.
Ikeda Bussan Company, Limited: *See*—
Takahashi, Fujio; and Tsujimura, Harutoshi, 4,132,434, Cl. 280-744.000.
Ikeda, Isamu; and Yamada, Kunimitsu, to Sugimura, Shigeru; and Yamada, Kunimitsu. Earth anchor and method of setting and removing same. 4,132,498, Cl. 61-39.000.
Imperial Chemical Industries Limited: *See*—
Young, Roger N., 4,132,050, Cl. 53-463.000.
Inaba, Hiromi: *See*—
Terunuma, Mutsuhiro; Shima, Seiya; Tashiro, Korefumi; Ando, Takeki; Inaba, Hiromi; Kurosawa, Toshiaki; and Kuroha, Hiroaki, 4,133,018, Cl. 361-87.000.
Inagaki, Sanji: *See*—
Nagai, Koji; Iwatsuki, Haruki; Inagaki, Sanji; and Kameda, Hiromi, 4,132,548, Cl. 96-1.0TE.
Incom International Inc.: *See*—
Langford, William D., 4,132,415, Cl. 277-12.000.
Incotex S.A.: *See*—
Bolea Camprubi, D. Anselmo, 4,132,249, Cl. 139-453.000.
Indicel Co., Ltd.: *See*—
Ineson, Norman; Dickinson, Stuart M.; and Livingstone, Charles E., 4,132,367, Cl. 242-47.100.
Indoor Billboard Corporation: *See*—
Hasselschwert, Clifford L., 4,132,524, Cl. 8-151.000.
Industrie Pirelli, S.p.A.: *See*—
Ferrentino, Antonio; Brovedan, Antonio; and Sala, Angelo, 4,132,756, Cl. 264-174.000.
Ineson, Norman; Dickinson, Stuart M.; and Livingstone, Charles E., to Indicel Co., Ltd. Cord winder. 4,132,367, Cl. 242-47.100.
Ingalls, Jeffrey D.: *See*—
Deschenes, Charles E.; and Ingalls, Jeffrey D., 4,132,004, Cl. 33-366.000.
Ingram, Charles E., to Four Star Corporation. Slidable bracket for article carrier. 4,132,335, Cl. 224-42.10F.
Ingram, Geoffrey S.: *See*—
Best, John S.; Hoyles, Ronald; Ingram, Geoffrey S.; and Skinner, Francis B. J., 4,132,773, Cl. 424-57.000.
Inmont Corporation: *See*—
Blackinton, Roswell J., 4,132,357, Cl. 239-11.000.
Inose, Fumiyuki: *See*—
Maio, Kenji; Inose, Fumiyuki; Yokozawa, Norio; Fujimoto, Ryoichi; and Takasugi, Kazuo, 4,132,085, Cl. 62-155.000.
Inoue, Hideo: *See*—
Ito, Tsunetoshi; and Inoue, Hideo, 4,132,079, Cl. 405-299.000.
Inoue, Kenzo. Ribbed conical-central dome diaphragm with tapered thickness components. 4,132,872, Cl. 179-115.50R.
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Amigues, Pierre; Gaillard, Jean; Le Page, Jean-Francois; and Stern, Robert, 4,132,745, Cl. 260-683.200.
Institute for Science of Labour: *See*—
Kimotsuki, Kuninori, 4,131,953, Cl. 2-171.100.
Intech Corporation: *See*—
Glaze, John W., Jr., 4,132,156, Cl. 93-51.100.
Interatom, Internationale Atomreaktorbau GmbH: *See*—
Benemann, Annelie; Schult, Norbert; Voj, Peter; and Hosemann, Bernhard, 4,132,115, Cl. 73-349.000.
International Business Machines Corporation: *See*—
Chappelow, Ronald E.; and Hunkele, Harry J., 4,132,818, Cl. 427-248.00R.
Cuomo, Jerome J.; DiStefano, Thomas H.; and Rosenberg, Robert, 4,132,571, Cl. 148-1.500.
Cuomo, Jerome J.; Gambino, Richard J.; and Harper, James M. E., 4,132,614, Cl. 204-192.0EC.
Feng, Joseph S., 4,132,864, Cl. 179-18.0FA.
Garcia, Joe L.; Hu, Paul Y.; and Waller, Tracy N., 4,132,890, Cl. 250-231.0SE.
Kurzweil, Fred, Jr., 4,133,011, Cl. 360-78.000.
Schaible, Paul M.; Schwartz, Geraldine C.; and Zielinski, Laura B., 4,132,586, Cl. 156-643.000.
Wang, Sherman S.; Wesley, Michael A.; and Will, Peter M., 4,132,318, Cl. 214-1.0BB.
International Flavors & Fragrances Inc.: *See*—
Haber, George J.; Tan, Chee T.; and Wu, Joanna, 4,132,793, Cl. 426-250.000.
International Harvester Company: *See*—
Chatterjea, Probir K., 4,132,302, Cl. 192-87.130.
Holloway, Gale A.; Lark, Wayne W.; McLaughlin, Phillip M.; and Mortonson, Robert M., 4,132,272, Cl. 172-2.000.
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Vidakovic, Aleksandar; and Salna, Karl, 4,132,258, Cl. 152-185.000.
International Paper Company: *See*—
Brandon, Ralph E.; Ring, Michael; and Morris, James B., 4,132,592, Cl. 162-216.000.
International Standard Electric Corporation: *See*—
Schwarzwalder, Jorg, 4,132,379, Cl. 246-167.00R.
Szechenyi, Kalman, 4,132,865, Cl. 179-18.0GF.
International Telephone and Telegraph Corporation: *See*—
Frisen, Robert A., 4,132,246, Cl. 137-536.000.
Perrotti, Emmanuel J., 4,132,992, Cl. 343-100.0PE.
International Water Saving Systems, Inc.: *See*—
Albertassi, James H.; and Heinze, Walter O., 4,131,959, Cl. 4-319.000.
INTERx Research Corporation: *See*—
Kaminski, James J.; and Bodor, Nicolae S., 4,132,805, Cl. 424-312.000.
Intonation Systems: *See*—
Stone, Thomas D., 4,132,143, Cl. 84-314.000.
Irick, Gether, Jr.; and Kelly, Charles A., to Eastman Kodak Company. Bis-heterocyclic benzoate ultraviolet stabilizers and their use in organic compositions. 4,132,704, Cl. 260-45.8NT.
Irwin, David W. Process and composition for pickling metal surfaces. 4,132,568, Cl. 134-3.000.
Ishige, Sadao; Usui, Hideo; and Saeki, Keiso, to Fuji Photo Film Co., Ltd. Recording material. 4,132,436, Cl. 282-27.500.
Ishii, Hakumi; Sogo, Yoshitaka; and Ida, Shuichiro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Remote-control gearshift mechanism for vehicular transmission. 4,132,123, Cl. 74-473.0SW.
Ishii, Koji, to Ryobi Ltd. Fluid supply apparatus for blanket cleaning device in offset printing machine. 4,132,167, Cl. 101-425.000.
Ishikawa Tekko Kabushiki Kaisha: *See*—
Yamamoto, Mitsuo, 4,132,942, Cl. 320-13.000.
Ishimoto, Sachio: *See*—
Kurozumi, Seizi; Toru, Takeshi; Tanaka, Toshio; Miura, Shuzi; Kobayashi, Makiko; Ishimoto, Sachio; and Matsubara, Sadakazu, 4,132,726, Cl. 260-448.80R.
Ishitobi, Kaoru: *See*—
Maekawa, Hideyuki; and Ishitobi, Kaoru, 4,132,527, Cl. 23-230.00B.
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Yamaguchi, Hisashi; Murase, Kenji; Ishizaki, Hiroyuki; and Kashiwara, Hirofumi, 4,132,924, Cl. 340-779.000.
ISM Equipements Industriels de Montage SA: *See*—
Binoth, Walter, 4,132,455, Cl. 312-97.100.
Italtractor I.T.M. S.p.A.: *See*—
Roli, Lino, 4,132,418, Cl. 277-91.000.
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ITT Industries, Inc.: *See*—
Greenwood, John C.; and Young, John M., 4,131,985, Cl. 29-580.000.
Ivanenko, Gennady V.: *See*—
Gurevich, Vladimir Z.; Prashin, Anatoly A.; Stoyakin, Vyacheslav P.; Ter-Minosian, Sergei M.; Frolov, Valery A.; Tolstykh, Viktor S.; Bogansky, Vasily V.; and Ivanenko, Gennady V., 4,132,339, Cl. 228-103.000.
Iwamoto, Eiji: *See*—
Yokoyama, Yasukazu; and Iwamoto, Eiji, 4,132,851, Cl. 544-245.000.
Iwase, Toshio; Hashimoto, Teruo; and Iguchi, Youko, to Niigata Engineering Co., Ltd. Method for treating gas liquor. 4,132,636, Cl. 210-6.000.
Iwatsuki, Haruki: *See*—
Nagai, Koji; Iwatsuki, Haruki; Inagaki, Sanji; and Kameda, Hiromi, 4,132,548, Cl. 96-1.0TE.
Izawa, Shinichi; Ohzeki, Jurou; Yahata, Tsuyoshi; and Nakanishi, Atsuo, to Asahi-Dow Limited. Graft copolymer composition of

styrene-polyphenylene ether and preparation thereof. 4,132,684, Cl. 260-4.0AR.
Izumi Products Company: *See*—
Suganuma, Yasuo; and Izumi, Toshio, 4,132,107, Cl. 72-416.000.
Izumi, Sumio: *See*—
Saitoh, Kozo; and Izumi, Sumio, 4,132,633, Cl. 209-9.000.
Izumi, Toshio: *See*—
Suganuma, Yasuo; and Izumi, Toshio, 4,132,107, Cl. 72-416.000.
J. I. Case Company: *See*—
Long, Elton B., 4,132,324, Cl. 214-138.00R.
J. J. Dill Company: *See*—
Dodds, Rand E., 4,132,026, Cl. 43-131.000.
J. M. Huber Corporation: *See*—
Kunkle, Albert C., 4,132,626, Cl. 204-301.000.
Wason, Satish K., 4,132,806, Cl. 424-357.000.
Jackson, David: *See*—
Ford, Michael A.; and Jackson, David, 4,132,481, Cl. 356-325.000.
Jackson, Gerald J., Jr.: *See*—
Blichare, Mitchell S.; and Jackson, Gerald J., Jr., 4,132,753, Cl. 264-25.000.
Jackson, Lawrence D. A. Pinch valve sleeve construction. 4,132,382, Cl. 251-5.000.
Jacquelin, Jean, to Compagnie Generale d'Electricite. Device for regenerating zinc. 4,132,623, Cl. 204-275.000.
Jacques, Andre; d'Auria, Luigi; and Moronville, Chantal, to Thomson-CSF. Connecting plug for optical cable. 4,132,461, Cl. 350-96.200.
Jaeschke, James R.: *See*—
Barcz, James P.; Bigelow, James H.; Jaeschke, James R.; Piber, Earl T.; and Spellman, Gordon B., 4,132,933, Cl. 318-346.000.
Janiszewski, Gregor K., to AB Volvo. Shift mechanism in a motor vehicle gear box. 4,132,125, Cl. 74-477.000.
Janke, William R. Blade for cutting wallboard. 4,131,996, Cl. 30-273.000.
Jannesson, Erik H. Apparatus for securing a charge carrier against longitudinal displacement with respect to a vehicle frame. 4,132,445, Cl. 296-35.00A.
Japan Synthetic Rubber Company, Limited: *See*—
Chikatsu, Tatsusuke; Shimokawa, Shinichi; Miura, Takao; and Okumura, Taro, 4,132,666, Cl. 252-309.000.
Jeffries, William G., to PPG Industries, Inc. Method of welding edges of glass sheets. 4,132,539, Cl. 65-40.000.
Jenkins, George P. Concrete screed machine. 4,132,492, Cl. 404-119.000.
Jens, Richard A.: *See*—
Hueschen, Robert E.; and Jens, Richard A., 4,132,916, Cl. 313-330.000.
Jeter, Wayburn S., to University Patents, Inc. Delivery of immunologically active components of transfer factor. 4,132,776, Cl. 424-101.000.
Jeumont-Schneider: *See*—
Coutard, Jean-Pierre G.; and Picandet, Jean A., 4,132,866, Cl. 179-15.0AQ.
Jewell, Donald K., to Restaurant Technology, Inc. Foam sandwich package. 4,132,344, Cl. 229-2.50R.
JLG Industries, Inc.: *See*—
Grove, John L., 4,132,040, Cl. 52-115.000.
John Wyeth & Brother Ltd.: *See*—
Crossley, Roger, 4,132,798, Cl. 424-270.000.
Johnson, Don E. Process and apparatus for obtaining useful energy from a body of liquid at moderate temperature. 4,132,077, Cl. 60-649.000.
Johnson, Howard L., to Caterpillar Tractor Co. External centering spring adjustment for a spool valve. 4,132,245, Cl. 137-377.000.
Johnson, Jay. Process for manufacturing resin-impregnated, reinforced articles without the presence of resin fumes. 4,132,755, Cl. 264-553.000.
Johnson, Jeffrey: *See*—
Gaus, Harry; Johnson, Jeffrey; Milutziki, Udo; and Schotte, Dietwald, 4,132,935, Cl. 318-480.000.
Johnson, Keith; and Hipkin, Frank, to Ace Furnaces Limited. Furnaces. 4,132,394, Cl. 266-138.000.
Johnson, Knute N. Ski binding. 4,131,963, Cl. 9-310.0AA.
Johnson, Lauren L.; and Wilson, Robert J., to General Motors Corporation. Electrical power supply fault detecting system. 4,133,017, Cl. 361-42.000.
Johnson, Ralph E.; and Urciola, John A., to Singer Company, The. Three position sewing machine cabinet platform. 4,132,454, Cl. 312-27.000.
Johnson, Thomas O., to General Electric Company. Locking arrangement for a household refrigerator. 4,132,440, Cl. 292-341.190.
Johnston, Everett A., to United States of America, National Aeronautics and Space Administration. Variable area exhaust nozzle. 4,132,068, Cl. 60-226.00A.
Jones, John C. Guide for cutting apparatus. 4,132,256, Cl. 144-253.00F.
Jones, Kenneth R.; and Schaefer, Daniel W., to Allis-Chalmers Corporation. Reversibly mountable clutch control handle mounted on collapsible handle of walk-behind lawn mower. 4,132,280, Cl. 180-19.00H.
Jones, Marvin R., to Cameron Iron Works, Inc. Pipe shearing ram assembly for blowout preventer. 4,132,267, Cl. 166-55.000.
Jos. Schlitz Brewing Company: *See*—
Larson, Robert M., 4,132,052, Cl. 53-75.000.
Joslyn Mfg. and Supply Co.: *See*—
Wilms, Manfred W., 4,132,915, Cl. 313-325.000.
Journee, Maurice A., to Paul Journee, S.A. Device for securing a wiper blade to an arm. 4,132,490, Cl. 403-316.000.
Jovick, Raymond J., to Rockwell International Corporation. Axle assembly with sintered metal rotor. 4,132,293, Cl. 188-181.00R.
Juba, Bernard T., to H. B. Fuller Company. Structural units. 4,132,043, Cl. 52-309.170.
Judah, Kenneth C.: *See*—
Boehme, Detlef R.; Judah, Kenneth C.; and Luchetti, Stephen J., 4,132,511, Cl. 417-540.000.
Kabushiki Kaisha Shikutani: *See*—
Akiyama, Satoshi; and Shikutani, Michio, 4,132,507, Cl. 417-234.000.
Kabushiki Kaisha Suwa Seikosha: *See*—
Fujimori, Yoshiaki, 4,132,062, Cl. 58-90.00R.
Sakurai, Yoshiyuki, 4,132,351, Cl. 235-454.000.
Kabushiki Kaisha Tomoku: *See*—
Shinomiya, Tsutomu, 4,132,157, Cl. 93-58.100.
Kabushikikaisha Yokogawa Denki Seisakusho: *See*—
Muramoto, Setsuo, 4,132,110, Cl. 73-32.00A.
Kaiser Cement & Gypsum Corporation: *See*—
Willis, Wilfred E., 4,132,565, Cl. 106-315.000.
Kaiser, Karl: *See*—
Scholz, Manfred; Kaiser, Karl; and Semmler, Horst, 4,132,006, Cl. 34-10.000.
Kakade, Madhu L., to Land O'Lakes, Inc. Method of feeding young animals. 4,132,808, Cl. 426-2.000.
Kamada, Daikichi. Packaging unit for use in the marketing of alarm systems. 4,132,312, Cl. 206-461.000.
Kameda, Hiromi: *See*—
Nagai, Koji; Iwatsuki, Haruki; Inagaki, Sanji; and Kameda, Hiromi, 4,132,548, Cl. 96-1.0TE.
Kameyama, Masayoshi; Horiguchi, Hiroshi; and Ichino, Kazuo, to Hitachi, Ltd. Driving signal control circuit. 4,132,939, Cl. 318-627.000.
Kaminski, James J.; and Bodor, Nicolae S., to INTERx Research Corporation. Novel soft N-chloroamino alcohol derivatives exhibiting antibacterial activity. 4,132,805, Cl. 424-312.000.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Saito, Ichiro; and Saito, Kazuo, 4,132,749, Cl. 260-876.00R.
Kania, Sigmund; and Frank, Wolfgang, to Daimler-Benz Aktiengesellschaft. Ventilating installation for a vehicle body, especially of a passenger motor vehicle. 4,132,158, Cl. 98-2.180.
Kao Soap Co., Ltd.: *See*—
Iijima, Eiji; Watanabe, Hiroshi; and Hayashi, Shizuo, 4,132,678, Cl. 252-545.000.
Tsutsumi, Hisao; Watanabe, Hiroshi; and Hayashi, Shizuo, 4,132,679, Cl. 252-545.000.
Kaplow, Roy; and Frank, Robert I., to Massachusetts Institute of Technology. Method of making a high-intensity solid-state solar cell. 4,131,984, Cl. 29-572.000.
Karavaev, Andron T.: *See*—
Tupitsyn, Konstantin K.; Cherednikov, Evgeny N.; Kostylev, Alexandr D.; Plavskikh, Vladimir D.; Klimashko, Vladimir V.; Tkach, Khaim B.; and Karavaev, Andron T., 4,132,277, Cl. 175-19.000.
Kashio, Toshio, to Casio Computer Co., Ltd. Electronic timepiece. 4,132,060, Cl. 58-23.00R.
Kashio, Toshio, to Casio Computer Co., Ltd. Data processing control apparatus with selective data readout. 4,133,041, Cl. 364-900.000.
Kashiwara, Hirofumi: *See*—
Yamaguchi, Hisashi; Murase, Kenji; Ishizaki, Hiroyuki; and Kashiwara, Hirofumi, 4,132,924, Cl. 340-779.000.
Kasuga, Akira: *See*—
Mukaida, Yoshito; Fujiyama, Masaaki; Komine, Shigeo; Igarashi, Masaaki; Yamaguchi, Nobutaka; Iida, Shinobu; and Kasuga, Akira, 4,132,827, Cl. 428-329.000.
Katsumoto, Kiyoshi; and Marquis, David M., to Chevron Research Company. Method of preparing vanadium (IV) phosphate composition with high intrinsic surface area. 4,132,670, Cl. 252-437.000.
Katz, Jonathon H., to Teradyne, Inc. Test fixture using stock printed circuit board having test pins mounted thereon. 4,132,948, Cl. 324-158.00F.
Katz, Sidney; and Rodgers, Billy R., to United States of America, Energy. Method for improving the sedimentation and filterability of coal-derived liquids. 4,132,639, Cl. 210-51.000.
Kaufmann, Helmut: *See*—
Koplin, Eckhard; Hoffmann, Horst; Raiff, Siegfried; Richter, Peter; and Kaufmann, Helmut, 4,132,235, Cl. 134-99.000.
Kawahara, Masanao: *See*—
Doi, Yuzuru; Kawahara, Masanao; and Tejima, Yasuyuki, 4,132,036, Cl. 51-124.00L.
Kawakami, Hiromi: *See*—
Hongu, Masayuki; Niimura, Tsutomu; and Kawakami, Hiromi, 4,132,952, Cl. 325-459.000.
Kawarada, Akira: *See*—
Hashimoto, Tohru; Kawarada, Akira; and Tamura, Sachiko, 4,132,541, Cl. 71-76.000.
Keely, Robert H. Sprinkler nozzle. 4,132,358, Cl. 239-204.000.
Kelly, Charles A.: *See*—
Irick, Gether, Jr.; and Kelly, Charles A., 4,132,704, Cl. 260-45.8NT.
Kemeny, George A.; and Cookson, Alan H., to Westinghouse Electric Corp. Multiple conductor gas insulated transmission line. 4,132,854, Cl. 174-27.000.
Ken Wilson Departures, Inc.: *See*—
Wilson, Kenneth L., 4,132,435, Cl. 280-772.000.
Kennecott Copper Corporation: *See*—
Frankiewicz, Theodore C.; and Luecders, Robert E., 4,132,758, Cl. 423-27.000.

Kennedy, Garth P.; Kennedy, William A., Jr.; Kennedy, Neal R.; and Elder, John W., to Corken Pump Company. Excess flow shutoff valve for hazardous fluids. 4,132,237, Cl. 137-75.000.
Kennedy, Neal R.: *See*—
Kennedy, Garth P.; Kennedy, William A., Jr.; Kennedy, Neal R.; and Elder, John W., 4,132,237, Cl. 137-75.000.
Kennedy, William A., Jr.: *See*—
Kennedy, Garth P.; Kennedy, William A., Jr.; Kennedy, Neal R.; and Elder, John W., 4,132,237, Cl. 137-75.000.
Kenney, Edward J., to Hooker Chemicals & Plastics Corp. Bipolar electrode. 4,132,622, Cl. 204-268.000.
Kent, Michael J.: *See*—
Tantram, Anthony D. S.; Kent, Michael J.; and Palmer, Alan G., 4,132,616, Cl. 204-195.00P.
Kenworthy, Clarence J. Auxiliary air displacement method and unit for furnaces. 4,132,354, Cl. 236-11.000.
Kerfoot, Derek G. E., to Noranda Mines Limited. Corrosion inhibiting molybdate pigment and preparation thereof. 4,132,667, Cl. 252-387.000.
Key, William P.; Ihrig, David C.; and Monroe, Darrell W., to FMC Corporation. Ozone disinfection in waste water treatment with recycling of ozonation off gas. 4,132,637, Cl. 210-7.000.
Khaitovich, Tsalel S.: *See*—
Arendt, Georgy A.; Pokrovsky, Vladimir V.; Burov, Boris A.; Lipovich, Alexandr L.; Romanov, Evgeny I.; Vainshtein, Galina L.; and Khaitovich, Tsalel S., 4,132,317, Cl. 212-49.000.
Khoja, Mirza A.; Gutierrez, Louis F.; and Perone, John T., to Baxter Travenol Laboratories, Inc. Rotor drive assembly for a centrifugal liquid processing apparatus. 4,132,349, Cl. 233-25.000.
Khutoretsky, Garri M.; Vorontsov, Alexandr I.; Drozdova, Larisa A.; and Yanik, Boris S. Six-phase winding of electric machine stator. 4,132,914, Cl. 310-184.000.
Kienel, Joseph E. Method and apparatus for seaming hosiery blanks. 4,132,183, Cl. 112-262.000.
Kihlstedt, Per G.; and Hassler, Hedvig E. B., to Advanced Mineral Research AB. Starting material for high-strength hydrothermally treated objects, and a method of producing such material. 4,132,559, Cl. 106-117.000.
Kim, Chong-Soo: *See*—
Hekimian, Norris C.; and Kim, Chong-Soo, 4,132,957, Cl. 330-51.000.
Kim, Leo, to Shell Oil Company. Hydrogen peroxide stabilization. 4,132,762, Cl. 423-272.000.
Kimball International, Inc.: *See*—
Slaats, Mathew A.; Overton, David E.; and Blessinger, James E., 4,132,483, Cl. 366-162.000.
Kimmel, Hans. Mixer, particularly heating-cooling mixer for chemical processes. 4,132,484, Cl. 366-288.000.
Kimotsuki, Kuninori, to Institute for Science of Labour. Ventilated head gear. 4,131,953, Cl. 2-171.100.
Kimura, Shiro G.; Lavigne, Raymond G.; and Browall, Warella R., to General Electric Company. Method for casting ultrathin methylpentene polymer membranes. 4,132,824, Cl. 428-220.000.
King, Harold M.; and Lesher, Melvin L. Multiple utility pedestal. 4,133,021, Cl. 361-365.000.
King, J. Frank; and Sloan, Donald A., to Hanes Corporation. Machine for continuous bias cutting of tubular fabric. 4,131,979, Cl. 29-2.190.
King, Robert D.; and Hiscutt, Robert, to Triplex Safety Glass Company Limited. Apparatus for producing metal oxide films. 4,132,624, Cl. 204-298.000.
Kiriki, Fumio: *See*—
Nomura, Hiroaki; Hitaka, Takenori; Akimoto, Hiroshi; Minami, Isao; Kiriki, Fumio; Matsuda, Tatsuichi; and Fugono, Takeshi, 4,132,789, Cl. 424-246.000.
Kirsch, Ulrich; and Krull, Manfred, to B. Braun Melsungen Aktiengesellschaft; and Carl Freudenberg, Kommanditgesellschaft. Fused fiber blood filter. 4,132,650, Cl. 210-491.000.
Kirtikar, Suvrat: *See*—
Escriva, Vincent R.; Kirtikar, Suvrat; Marshall, Edward W.; and Minard, Charles D., 4,131,986, Cl. 29-592.00R.
Kishi, Emiko: *See*—
Tohmatsu, Jun-ichi; Morimoto, Tomiaki; and Kishi, Emiko, 4,132,767, Cl. 424-1.000.
Kiss, Laszlo; Csillag, Laszlo; Halmai, Karoly; and Miskolczi, Laszlo, to Muanyagipari Kutato Intezet. Linearly moving or rotated flat armature for motor and pulling magnets. 4,132,910, Cl. 310-12.000.
Kitaura, Mashio, to Minolta Camera Kabushiki Kaisha. Automatic control device for cameras. 4,132,985, Cl. 340-347.0AD.
Kitchen, John P., to Hoover Universal, Inc. Formed wire box spring with wire grid unit. 4,131,961, Cl. 5-247.000.
Kittler, Wolfram; and Rotter, Gerhard, to BASF Aktiengesellschaft. Color video tape recording/playback system. 4,133,009, Cl. 360-9.000.
Klein, Yitzchak; and Goldstein, Jonathan R., to State of Israel, Ministry of Industry, Commerce and Tourism, National Physical Laboratory of Israel; and Scientific Research Foundation, The. Electrocatalyst. 4,132,619, Cl. 204-242.000.
Kleykamp, Donald L.: *See*—
Neroni, Peter J.; and Kleykamp, Donald L., 4,132,576, Cl. 156-143.000.
Klieger, Erich; and Speck, Ulrich, to Schering Aktiengesellschaft. Novel iodized isophthalamic acid compounds. 4,132,731, Cl. 424-5.000.
Klimashko, Vladimir V.: *See*—
Tupitsyn, Konstantin K.; Cherednikov, Evgeny N.; Kostylev, Alexandr D.; Plavskikh, Vladimir D.; Klimashko, Vladimir V.; Tkach, Khaim B.; and Karavaev, Andron T., 4,132,277, Cl. 175-19.000.
Klotz, Erhard; and Tiemens, Ulf, to U.S. Philips Corporation. Method of forming layered images of objects from superposition images of different image planes. 4,132,896, Cl. 250-445.00T.
Kluender, Harold C.; Woessner, Warren D.; and Biddlecom, William G., to Miles Laboratories, Inc. Preparation of 15-deoxy-16-hydroxy-prostaglandins. 4,132,738, Cl. 260-586.00R.
Klyavin, Yanis K.: *See*—
Rode, Oyars A.; Lusis, Andrei R.; Klyavin, Yanis K.; and Zamozdik, Talivaldis V., 4,132,465, Cl. 350-357.000.
Knifton, John F., to Texaco Inc. Process for separating liquid olefin-paraffin mixtures. 4,132,744, Cl. 260-677.00A.
Knollmueller, Karl O., to Olin Corporation. Functional fluid method using alkoxysilane multiple cluster compounds. 4,132,664, Cl. 252-78.300.
Knox, James H. Intercommunication system. 4,132,869, Cl. 179-38.000.
Knutson, Richard K., to General Mills, Inc. Process for preparing fabricated bacon. 4,132,810, Cl. 426-104.000.
Kobayakawa, Masaki; Yawata, Kazufumi; Hirano, Kiyoshige; and Yamashita, Shigeru, to Nippon Electric Kagoshima. Luminescent display panel having a transparent and conductive film mainly on a window inside surface of a glass cover and a method of manufacturing the same. 4,132,920, Cl. 313-497.000.
Kobayashi, Makiko: *See*—
Kurozumi, Seizi; Toru, Takeshi; Tanaka, Toshio; Miura, Shuzi; Kobayashi, Makiko; Ishimoto, Sachio; and Matsubara, Sadakazu, 4,132,726, Cl. 260-448.80R.
Kobayashi, Shoichi: *See*—
Ueshima, Takashi; Yokoyama, Toshiro; and Kobayashi, Shoichi, 4,132,750, Cl. 260-887.000.
Kobayashi, Takumi: *See*—
Urano, Fumio; Arai, Akihiro; Kobayashi, Takumi; and Umetsu, Junji, 4,132,472, Cl. 354-155.000.
Kobori, Itsuro: *See*—
Aya, Masahiro; Fukazawa, Nobuo; Kurihara, Kazuo; and Kobori, Itsuro, 4,132,543, Cl. 71-88.000.
Koch, Kenneth F.: *See*—
Wessler, Louis E.; and Koch, Kenneth F., 4,133,007, Cl. 358-280.000.
Koehlert, Charles I.: *See*—
Priese, Werner K.; and Koehlert, Charles I., 4,132,071, Cl. 60-328.000.
Koehring Company: *See*—
Briggs, Eugene C.; Shaftner, Robert F.; and Giambrone, Harry J., 4,132,353, Cl. 236-10.000.
Sousek, Eugene A.; Stroemer, John R.; and Whitsitt, Steven L., 4,132,941, Cl. 318-663.000.
Koike, Nobuhiko, to Nippon Electric Co., Ltd. Majority decision device. 4,132,975, Cl. 340-146.1BA.
Kokusan Denki Co., Ltd.: *See*—
Yukawa, Hideki, 4,132,208, Cl. 123-148.0CC.
Kolberg, Ole-Robert, to A/S Nycotron. Means for regulating and monitoring dialysis of blood in a dialyzer. 4,132,644, Cl. 210-85.000.
Kolosov, Ivan A. Automatic device for sorting flat articles. 4,132,313, Cl. 209-560.000.
Komatsu, Toshiyuki: *See*—
Endo, Ichiro; Komatsu, Toshiyuki; and Takasu, Yoshio, 4,132,882, Cl. 219-216.000.
Kombinat Opakowan Blaszanych Lekkich "Opakomet", Fabryka Opakowan Blaszanych: *See*—
Kubik, Zbigniew; Sieracki, Piotr; and Skotarczyk, Edmund, 4,132,185, Cl. 113-120.00R.
Komine, Shigeo: *See*—
Mukaida, Yoshito; Fujiyama, Masaaki; Komine, Shigeo; Igarashi, Masaaki; Yamaguchi, Nobutaka; Iida, Shinobu; and Kasuga, Akira, 4,132,827, Cl. 428-329.000.
Komma, Gerhard; Kothe, Dieter; and Rahmfeld, Werner, to DEMAG Aktiengesellschaft. Support, drive and guide roller stand for metal strand casting plants, particularly for steel slab curved strand casting plant. 4,132,261, Cl. 164-448.000.
Kommanditbolaget United Stirling (Sweden) AB & Co.: *See*—
Lagerqvist, Roy S. G., 4,132,417, Cl. 277-27.000.
Lundholm, Gunnar S. K., 4,132,420, Cl. 277-160.000.
Kondo, Hidenobu, to Nippon Kogaku K.K. Film transport structure in a camera. 4,132,473, Cl. 354-203.000.
Kondo, Toshihiro, to Kondo, Toshihiro; and Fuji Photo Film Co., Ltd. Device for automatically focusing image. 4,132,888, Cl. 250-204.000.
Koninklijke Emballage Industrie Van Leer BV: *See*—
Larsen, Hans-Ole; Barfoed, Sven; and Gent, John A. G., 4,132,683, Cl. 521-106.000.
Koplin, Eckhard; Hoffmann, Horst; Raiff, Siegfried; Richter, Peter; and Kaufmann, Helmut, to BASF Aktiengesellschaft. Apparatus for treating printing plates. 4,132,235, Cl. 134-99.000.
Kostner, Armin: *See*—
Gerigk, Gunter; Bittner, Klaus-Jurgen; and Kostner, Armin, 4,132,047, Cl. 53-396.000.
Kostylev, Alexandr D.: *See*—
Tupitsyn, Konstantin K.; Cherednikov, Evgeny N.; Kostylev, Alexandr D.; Plavskikh, Vladimir D.; Klimashko, Vladimir V.; Tkach, Khaim B.; and Karavaev, Andron T., 4,132,277, Cl. 175-19.000.
Kothe, Dieter: *See*—
Komma, Gerhard; Kothe, Dieter; and Rahmfeld, Werner, 4,132,261, Cl. 164-448.000.

Kountz, Kenneth J., to Borg-Warner Corporation. Temperature control system for refrigeration apparatus. 4,132,086, Cl. 62-209.000.

Koyanagi, Michitoshi: *See—*
Toyoshima, Kazuaki; Koyanagi, Michitoshi; and Suzuki, Tameyuki, 4,132,686, Cl. 260-21.000.

Kraft, Harald: *See—*
Weiss, Helmut; Kraft, Harald; and Igel, Wolfgang, 4,132,057, Cl. 57-261.000.

Kraft, Wolfgang, to Murata Manufacturing Co., Ltd. Method of manufacturing a monolithic integrated circuit utilizing epitaxial deposition and simultaneous outdiffusion. 4,132,573, Cl. 148-175.000.

Krahn, Heinrich: *See—*
Northemann, Karl-Heinz; and Krahn, Heinrich, 4,131,967, Cl. 15-167.00A.

Kramer, Petrus A.: *See—*
Verbrugge, Pieter A.; and Kramer, Petrus A., 4,132,728, Cl. 260-465.00G.

Kranz, Eckart: *See—*
Cramm, Gunther; Kranz, Eckart; and Hellrung, Gunter, 4,132,736, Cl. 260-552.0SC.

Krautkramer-Branson, Incorporated: *See—*
Primbsch, Erik, 4,132,117, Cl. 73-607.000.

Kreft, Robert; and Torper, Udo, to Schaffran Propeller Lehne & Co. Variable-pitch propeller. 4,132,503, Cl. 416-167.000.

Kresge, Edward N.: *See—*
Gessler, Albert M.; and Kresge, Edward N., 4,132,698, Cl. 260-33.6AQ.

Kreuer, Karl D.; and Schulte, Klaus, to Bayer Aktiengesellschaft. Process and apparatus for the preparation of a reaction mixture for the production of plastic foams. 4,132,838, Cl. 521-50.000.

Kriger, Jury N.: *See—*
Rabinovich, Volf I.; Kriger, Jury N.; Svitenko, Igor A.; and Sapunov, Viktor E., 4,132,545, Cl. 75-10.00C.

Kruger, Heinz W. Crescent gear pump or motor having bearing means for supporting the ring gear. 4,132,515, Cl. 418-71.000.

Kruger, Max, to Kusters, Eduard. Nozzle for producing a wide liquid jet. 4,132,363, Cl. 239-455.000.

Krull, Manfred: *See—*
Kirsch, Ulrich; and Krull, Manfred, 4,132,650, Cl. 210-491.000.

Krzys, Thaddeus W., Jr.: *See—*
Holdren, Earl J.; Polasek, Peter; and Krzys, Thaddeus W., Jr., 4,132,946, Cl. 324-73.00R.

Kubik, Zbigniew; Sieracki, Piotr; and Skotarczyk, Edmund, to Kombinat Opakowan Blaszanych Lekkich "Opakomet", Fabryka Opakowan Blaszanych. Method of fastening an aluminum anode to the bottom of a metal container. 4,132,185, Cl. 113-120.00R.

Kubo, Masaharu: *See—*
Masuda, Hiroo; Kubo, Masaharu; and Hori, Ryoichi, 4,132,997, Cl. 357-23.000.

Kubota, Ltd.: *See—*
Yamada, Hirofumi; Takaki, Noboru; and Masuda, Michio, 4,132,590, Cl. 162-145.000.

Kubota, Tetsuo; Noshiro, Atsumi; and Suzuki, Norimoto, to Dai Nippon Insatsu Kabushiki Kaisha. Magnetic card. 4,132,350, Cl. 235-493.000.

Kubota, Yuzuru: *See—*
Okuyama, Toshiaki; Kubota, Yuzuru; and Nagase, Hiroshi, 4,132,931, Cl. 318-732.000.

Kucklick, Frederick C., to Manufacturing Technology, Inc. Welding method and apparatus. 4,132,340, Cl. 228-113.000.

Kuhla, Donald E.; and Plattner, Jacob J., to Pfizer Inc. 4-Pyrone prostaglandin antagonists. 4,132,847, Cl. 542-441.000.

Kulina, Mark R., to Curtiss-Wright Corporation. Rotary engine counterweight system. 4,132,513, Cl. 418-60.000.

Kullendorff, Anders, to BBC Brown, Boveri & Company Limited. Method for manufacturing a pipeline having an internal protective layer. 4,132,343, Cl. 228-168.000.

Kume, Toyohiko: *See—*
Aya, Masahiro; Saito, Junichi; Kume, Toyohiko; and Yasui, Kazuomi, 4,132,542, Cl. 71-86.000.

Kumm, Emerson L., to Garrett Corporation, The. Turbine engine with differential gearing between high pressure turbine and compressor. 4,132,064, Cl. 60-39.140.

Kunkle, Albert C., to J. M. Huber Corporation. Electroflocculation cell. 4,132,626, Cl. 204-301.000.

Kurasawa, Takanao: *See—*
Sato, Minoru; Takahashi, Isao; Kurasawa, Takanao; Yoshioka, Yoshio; and Nakagawa, Yukio, 4,132,876, Cl. 200-148.00A.

Kurganov, Viktor V.: *See—*
Andoniev, Sergei M.; Gritsuk, Lev D.; Gorbik, Anatoly S.; Kurganov, Viktor V.; Oleinik, Nikolai P.; Rivlin, Grigory I.; Stetsenko, Nikolai V.; Shamil, Jury P.; Smetanin, Jury G.; and Nesterenko, Petr S., 4,132,852, Cl. 13-32.000.

Kurihara, Kazuo: *See—*
Aya, Masahiro; Fukazawa, Nobuo; Kurihara, Kazuo; and Kobori, Itsuro, 4,132,543, Cl. 71-88.000.

Kuroda, Noriaki: *See—*
Sano, Sinitiro; Kuroda, Noriaki; and Sakai, Tsuyoshi, 4,132,938, Cl. 318-568.000.

Kuroha, Hiroaki: *See—*
Terunuma, Mutsuhiro; Shima, Seiya; Tashiro, Korefumi; Ando, Takeki; Inaba, Hiromi; Kurosawa, Toshiaki; and Kuroha, Hiroaki, 4,133,018, Cl. 361-87.000.

Kuroiwa, Hiroshi; Nishimura, Yutaka; Ohyama, Yoshishige; and Nishimiya, Torazo, to Hitachi, Ltd. Air-fuel ratio control apparatus. 4,132,199, Cl. 123-119.0EC.

Kurosawa, Toshiaki: *See—*
Terunuma, Mutsuhiro; Shima, Seiya; Tashiro, Korefumi; Ando, Takeki; Inaba, Hiromi; Kurosawa, Toshiaki; and Kuroha, Hiroaki, 4,133,018, Cl. 361-87.000.

Kurozumi, Seizi; Toru, Takeshi; Tanaka, Toshio; Miura, Shuzi; Kobayashi, Makiko; Ishimoto, Sachio; and Matsubara, Sadakazu, to Teijin Limited. Process for the preparation of 4-hydroxycyclopent-2-en-1-one derivatives. 4,132,726, Cl. 260-448.80R.

Kurth, William T.: *See—*
Caruso, Paul J.; and Kurth, William T., 4,132,570, Cl. 136-89.00P.

Kurzweil, Fred, Jr., to International Business Machines Corporation. Sampled data positioning system employing a model of the physical system for time optimal control. 4,133,011, Cl. 360-78.000.

Kusserow, Bernd, to Siemens Aktiengesellschaft. Device for displaying a measuring voltage, for example an EKG signal, on the viewing screen of an oscillograph tube. 4,133,046, Cl. 365-45.000.

Kusters, Eduard: *See—*
Kruger, Max, 4,132,363, Cl. 239-455.000.

Kuus, Felix, to BJ-Hughes Inc. Apparatus for feeding perforation sealer balls and the like into well treating fluid. 4,132,243, Cl. 137-268.000.

Kvanta, Endre, to AB Medipharm. Method for cultivation of bacteria. 4,132,597, Cl. 195-96.000.

Kvita, Vratislav; Darms, Roland; and Greber, Gerd, to Ciba-Geigy Corporation. Imidyl-benzene-dicarboxylic and -tricarboxylic acid derivatives. 4,132,716, Cl. 260-326.340.

Kwan, Okun, to Bunker Ramo Corporation. Ribbon platform mechanism for extending ribbon life. 4,132,486, Cl. 400-213.000.

Lacombat, Michael: *See—*
Dubroeucq, Georges; and Lacombat, Michael, 4,132,479, Cl. 355-71.000.

Ladd, James T. Restraining garment. 4,132,230, Cl. 128-134.000.

Ladin, Eli M., to Federal-Mogul Corporation. Method of making a locking collar for an antifriction bearing assembly. 4,132,105, Cl. 72-356.000.

Lagerqvist, Roy S. G., to Kommanditbolaget United Stirling (Sweden) AB & Co. Pressure responsive sealing means. 4,132,417, Cl. 277-27.000.

Lake, Don W., to Fairchild Camera and Instrument Corporation. Digitally synthesized multi-frequency signal generator. 4,132,871, Cl. 179-84.0VF.

Lamar, John E., to United States of America, National Aeronautics and Space Administration. Vortex-lift roll-control device. 4,132,375, Cl. 244-90.00R.

Lamb, Frank, to Ciba-Geigy AG. Polyester plasticizers. 4,132,696, Cl. 260-31.600.

Lamberti, Vincent; and Willis, Chester R., to Lever Brothers Company. Detergent compositions. 4,132,735, Cl. 562-582.000.

Lamport, Ivan R.: *See—*
Avery, Bennett W.; Herr, Charles H., Jr.; and Lamport, Ivan R., 4,132,134, Cl. 74-801.000.

Land O'Lakes, Inc.: *See—*
Kakade, Madhu L., 4,132,808, Cl. 426-2.000.

Lang, Gunther. Manned space flight body. 4,132,373, Cl. 244-159.000.

Lang, Walter W., to Westinghouse Electric Corp. Current limiting circuit breaker with improved magnetic drive device. 4,132,968, Cl. 335-16.000.

Langford, William D., to Incom International Inc. Wiper apparatus for cable rods. 4,132,415, Cl. 277-12.000.

Langlie, Howard: *See—*
Berg, Albert T., Jr.; and Langlie, Howard, 4,132,489, Cl. 403-305.000.

Langon, Bernard: *See—*
Morel, Paul; Dugois, Jean-Pierre; and Langon, Bernard, 4,132,621, Cl. 204-243.00M.

Lankenau, Henry G.; and Flores, Alfonso R., to Ecodyne Corporation. Evaporator. 4,132,587, Cl. 159-27.00A.

Lark, Wayne W.: *See—*
Holloway, Gale A.; Lark, Wayne W.; McLaughlin, Phillip M.; and Mortonson, Robert M., 4,132,272, Cl. 172-2.000.

Larsen, Hans-Ole; Barfoed, Sven; and Gent, John A. G., to Koninklijke Emballage Industrie Van Leer BV. Process of preparing polyfuran foams. 4,132,683, Cl. 521-106.000.

Larson, Robert M., to Jos. Schlitz Brewing Company. Apparatus for removing bungs from kegs. 4,132,052, Cl. 53-75.000.

Larsson, Karl O. A. H. Apparatus for picking-up and removing objects. 4,132,442, Cl. 294-25.000.

Laske, Richard F.: *See—*
Bhakuni, Roop S.; and Laske, Richard F., 4,132,693, Cl. 260-29.300.

Lassiere, Alan, to A. Lassiere Ltd. Foldable bicycle. 4,132,428, Cl. 280-278.000.

Latsch, Reinhard: *See—*
Bianchi, Valerio; Metcher, Siegfried; Latsch, Reinhard; Weidner, Hans; and Brettschneider, Johannes, 4,132,195, Cl. 123-32.0EA.

Laurelli, James A.: *See—*
Shah, Chandra C.; and Laurelli, James A., 4,132,114, Cl. 73-343.00R.

Lautner, Max E.; and Flint, Thomas J., to Gould Inc. Field-coil bobbin with built-in-one-shot thermal protector. 4,132,913, Cl. 310-68.00C.

Lavigne, Raymond G.: *See—*
Kimura, Shiro G.; Lavigne, Raymond G.; and Browall, Warella R., 4,132,824, Cl. 428-220.000.

Leach, Harry W.: *See—*
Hebeda, Ronald E.; Holik, Dennis J.; and Leach, Harry W., 4,132,595, Cl. 195-31.00R.

Leas, Arnold M. Integrated coal conversion process. 4,132,627, Cl. 208-10.000.

LeBlanc, Larry M.: *See*—
Brown, William T.; Moran, Robert J.; and LeBlanc, Larry M., 4,132,250, Cl. 140-115.000.
Le Brise, Raymond, to Societe Anonyme Francaise du Ferodo. Method of producing an annular part for use as a diaphragm. 4,132,103, Cl. 72-326.000.
Lechanu, Jacques; and Gilbaut, Fernand, to Societe Anonyme dite: Le Joint Francais. Composite seal ring. 4,132,399, Cl. 277-47.000.
Lee, Eugene O. Valve mechanism for a control valve. 4,132,386, Cl. 251-171.000.
Lee, Lawrence J., Jr., to General Electric Company. Pulsating hair dryer. 4,132,360, Cl. 239-383.000.
Leek, James A. Rotating chamber for food freezer. 4,132,458, Cl. 312-305.000.
Leeson, Plato J., to Woodward Governor Company. Fuel supply system for a missile or the like. 4,132,165, Cl. 102-49.800.
Lehman, James A. Flying saucer toy with selectively positionable finger grip support legs. 4,132,030, Cl. 46-74.00D.
Lehmann, Werner: *See*—
Straubel, Max; Ritter, Ernst; Maier, Sieghart; and Lehmann, Werner, 4,132,206, Cl. 123-140.00R.
Lehner, Aladar; and Varga, Istvan, to Duoroll A.G. Multi-wheel in-line roller skates. 4,132,425, Cl. 280-11.230.
Leinaar, Dennis J., to Raaniel Industries, Inc. Tire mounted support bracket for vehicle accessories. 4,132,336, Cl. 224-42.130.
Leisner, Egon: *See*—
Dessauer, Guido; Leisner, Egon; and Rohr, Alfred, 4,132,826, Cl. 428-314.000.
Leiter, Herbert, to Ernst Leitz Wetzlor GmbH. Exposure measuring system for microscope attached cameras. 4,132,891, Cl. 250-239.000.
Lemay, Richard A.: *See*—
Huettner, Robert E.; Grandmaison, John P.; Vernon, John H.; Lemay, Richard A.; and Beauchemin, Edward, 4,133,030, Cl. 364-200.000.
Le Nen, Yvon: *See*—
Ferret, Francois; Doussoux, Pierre; and Le Nen, Yvon, 4,132,862, Cl. 179-15.0AF.
Le Page, Jean-Francois: *See*—
Amigues, Pierre; Gaillard, Jean; Le Page, Jean-Francois; and Stern, Robert, 4,132,745, Cl. 260-683.200.
L'Eplattenier, Francois; Pugin, Andre; and von der Crone, Jost, to Ciba-Geigy Corporation. Metal complexes of azomethines and process for their manufacture. 4,132,708, Cl. 546-7.000.
Lerner, Martin L., to Zenith Radio Corporation. Method for cathode coating erosion suppression for a television tube. 4,132,459, Cl. 316-18.000.
Lerner, Robert, to Formulette Co., Inc. Integrally molded pacifier for infants. 4,132,232, Cl. 128-360.000.
Leschonski, Kurt: *See*—
Rumpf, Hans; and Leschonski, Kurt, 4,132,634, Cl. 209-136.000.
Lesher, Melvin L.: *See*—
King, Harold M.; and Lesher, Melvin L., 4,133,021, Cl. 361-365.000.
Le Van, Eugene B. Quick-release-hinge device. 4,131,970, Cl. 16-147.000.
Lever Brothers Company: *See*—
Best, John S.; Hoyles, Ronald; Ingram, Geoffrey S.; and Skinner, Francis B. J., 4,132,773, Cl. 424-57.000.
Lamberti, Vincent; and Willis, Chester R., 4,132,735, Cl. 562-582.000.
Levinthal, Cyrus. System for storing and retrieving information at the molecular level. 4,133,047, Cl. 365-118.000.
Lew, Hyok S. Vari-scale-style scriber. 4,131,999, Cl. 33-23.00R.
Lewis, David G. A.; and Connolly, Michael G., to Dacon Display Services Limited. Merchandise multiplying display. 4,132,456, Cl. 312-223.000.
Licentia Patent-Verwaltungs-G.m.b.H: *See*—
Nutz, Karl-Diether, 4,132,909, Cl. 307-354.000.
Russer, Peter, 4,132,956, Cl. 330-5.000.
Lindberg, John E., to Owen, Wickersham & Erickson. Fluid mixing apparatus. 4,132,247, Cl. 137-806.000.
Linden-Alimak AB: *See*—
Svensson, Torbjorn, 4,132,276, Cl. 173-1.000.
Linder, Ernst; Steinke, Leo; and Rieger, Franz, to Robert Bosch GmbH. Internal combustion engine exhaust gas oxygen sensor and catalyzer combination. 4,132,615, Cl. 204-195.00S.
Lindo, Neil A.: *See*—
Zinnes, Harold; and Lindo, Neil A., 4,132,792, Cl. 424-250.000.
Lipovich, Alexandr L.: *See*—
Arendt, Georgy A.; Pokrovsky, Vladimir V.; Burov, Boris A.; Lipovich, Alexandr L.; Romanov, Evgeny I.; Vainshtein, Galina L.; and Khaitovich, Tsalel S., 4,132,317, Cl. 212-49.000.
Liquid Xtal Displays Inc.: *See*—
Gross, Gerald G., 4,132,984, Cl. 350-336.000.
Litton Business Systems, Inc.: *See*—
Daigle, Phillip R., 4,132,877, Cl. 200-296.000.
Littwin, Burkhard, to Siemens Aktiengesellschaft. Cylindrical domain memory. 4,133,045, Cl. 365-39.000.
Litvinov, Igor A.: *See*—
Gryaznov, Vladimir M.; Smirnov, Viktor S.; Vdovin, Valentin M.; Ermilova, Margarita M.; Gogua, Lia D.; Pritula, Nina A.; and Litvinov, Igor A., 4,132,668, Cl. 252-430.000.
Liu, Chao Kai, to Bell Telephone Laboratories, Incorporated. Key telephone system optically coupled protective coupler. 4,132,870, Cl. 179-81.00R.
Livingstone, Charles E.: *See*—
Ineson, Norman; Dickinson, Stuart M.; and Livingstone, Charles E., 4,132,367, Cl. 242-47.100.
Lo, Allen K. W.; and Nims, Jerry C., to Dimensional Development Corp. Projection apparatus for stereoscopic pictures. 4,132,468, Cl. 353-7.000.
Lobeck, Walter G., Jr.: *See*—
Wu, Yao H.; and Lobeck, Walter G., Jr., 4,132,794, Cl. 424-257.000.
Lockheed Corporation: *See*—
Sharples, Wilbert, 4,132,376, Cl. 244-104.00R.
Lockheed Missiles & Space Company, Inc.: *See*—
Maple, T. Grant, 4,132,919, Cl. 313-466.000.
Miller, Henry F.; Borts, Abraham; and Weiss, Folker H., 4,132,648, Cl. 210-242.00R.
Loesch, Claude E.: *See*—
Loesch, Leo J.; and Loesch, Claude E., 4,132,322, Cl. 214-17.0DB.
Loesch, Leo J.; and Loesch, Claude E. Silo unloader winch drive. 4,132,322, Cl. 214-17.0DB.
Lohmer, Wilfried; and Schotten, Josef, to Carborundum Company, The. Process for the production of spherical bonded abrasive from abrasive grain. 4,132,533, Cl. 51-295.000.
Long, E. David, to Allied Chemical Corporation. Fuel injection system with switchable starting mode. 4,132,210, Cl. 123-179.00L.
Long, Elton B., to J. I. Case Company. Stabilizer assembly. 4,132,324, Cl. 214-138.00R.
Long, John G.; and Watts, Nicholas P., to Durst (U.K.) Limited. Illumination system for a photographic copying apparatus. 4,132,478, Cl. 355-71.000.
Loprest, Frank J.; and McInerney, Eugene F., to GAF Corporation. Imaging system. 4,132,549, Cl. 96-35.000.
L'Oreal: *See*—
Goncalves, Antonin, 4,132,308, Cl. 206-219.000.
Louis, Arnold S.: *See*—
De Luca, Paul V.; Carney, William V.; and Louis, Arnold S., 4,132,814, Cl. 427-113.000.
Lowe, James L.: *See*—
Wendel, Ion L., 4,132,074, Cl. 60-641.000.
Luber, Werner. Method and apparatus for hardening of foundry cores. 4,132,260, Cl. 164-16.000.
Lucas Industries Limited: *See*—
Bartlett, Peter J.; and Taylor, Herbert D. B., 4,132,646, Cl. 210-114.000.
Hillyard, Peter T., 4,132,969, Cl. 336-94.000.
Luchetti, Stephen J.: *See*—
Boehme, Detlef R.; Judah, Kenneth C.; and Luchetti, Stephen J., 4,132,511, Cl. 417-540.000.
Lueders, Robert E.: *See*—
Frankiewicz, Theodore C.; and Lueders, Robert E., 4,132,758, Cl. 423-27.000.
Luftkonditionering AB: *See*—
Dellrud, Rolf L.; and Hallberg, Torsten R., 4,132,159, Cl. 98-42.00R.
Lundholm, Gunnar S. K., to Kommanditbolaget United Stirling (Sweden) AB & Co. Sealing rings for stirling engines. 4,132,420, Cl. 277-160.000.
Lusis, Andrei R.: *See*—
Rode, Oyars A.; Lusis, Andrei R.; Klyavin, Yanis K.; and Zamozdik, Talivaldis V., 4,132,465, Cl. 350-357.000.
Lyman, Harold T., Jr., to Questech, Inc., a part interest. Navigation devices. 4,132,113, Cl. 73-178.00R.
Lynch, Thomas J.: *See*—
Heilman, William J.; and Lynch, Thomas J., 4,132,663, Cl. 252-59.000.
Lyons, James E.; Schneider, Abraham; and Myers, Harry K., Jr., to Suntech, Inc. Process for making codimers of norbornadiene and phenylacetylenes using a cobalt catalyst. 4,132,742, Cl. 260-668.00A.
M&T Chemical Inc.: *See*—
Ejk, Adam J., 4,132,691, Cl. 260-23.0XA.
Maas, Johannes: *See*—
Noordermeer, Cornelis J.; and Maas, Johannes, 4,133,033, Cl. 364-424.000.
Mach, Joseph F.: *See*—
Eolin, Robert W.; Foster, Gordon F.; Mach, Joseph F.; and Maschmeyer, Richard O., 4,132,538, Cl. 65-32.000.
Machen, Lonnie. Teaching-learning aid for numeration systems and basic computer concepts. 4,132,015, Cl. 35-31.00F.
Machlett Laboratories, Inc., The: *See*—
Braun, Martin, 4,132,654, Cl. 250-320.000.
MacKenzie, Burton T., Jr.: *See*—
Anderson, Harry C.; MacKenzie, Burton T., Jr.; Prober, Maurice; and Singh, Nirmal, 4,132,858, Cl. 174-120.0SR.
MacLean, Alexander, to Electro Switch Corp. Control switch relay and control circuit means. 4,133,020, Cl. 361-156.000.
Mader, Oscar J. Hackamore bridle. 4,132,054, Cl. 54-6.00R.
Maekawa, Hideyuki; and Ishitobi, Kaoru, to Shionogi & Co., Ltd. Diagnostic compositions, diagnosing instruments, and methods of manufacturing same. 4,132,527, Cl. 23-230.00B.
Maeno, Jun, to Hideki Ishii. Liquid crystal device. 4,132,464, Cl. 350-351.000.
Magerle, Karl. Collapsible packing tube. 4,132,331, Cl. 222-107.000.
Magnuson Engineers, Inc.: *See*—
Magnuson, Robert M., 4,132,162, Cl. 99-630.000.
Magnuson, Robert M., to Magnuson Engineers, Inc. Apparatus for peeling fruits and vegetables. 4,132,162, Cl. 99-630.000.

Maier, Sieghart: *See*—
Straubel, Max; Ritter, Ernst; Maier, Sieghart; and Lehmann, Werner, 4,132,206, Cl. 123-140.00R.

Maille, Jacques H. P.; and Salaville, Andre, to Societe Anonyme de Telecommunications. Semiconductor devices. 4,132,999, Cl. 357-30.000.

Maio, Kenji; Inose, Fumiyuki; Yokozawa, Norio; Fujimoto, Ryoichi; and Takasugi, Kazuo, to Hitachi, Ltd. Control apparatus including an electronic timer. 4,132,085, Cl. 62-155.000.

Makela, Markku, to Rauma-Repola Oy. Lubrication arrangement for the blade chain of a felling saw. 4,132,289, Cl. 184-15.00R.

Malacheski, Joseph J.; and Zenda, Richard J. Insect capturing device. 4,132,027, Cl. 43-134.000.

Malhotra, Sudarshan K., to Dow Chemical Company, The. (Substituted pyridyl)phenoxy phosphorus compounds and their use as insecticides. 4,132,783, Cl. 424-200.000.

Malhotra, Sudarshan K., to Dow Chemical Company, The. (Substituted pyridyl)phenoxy phosphorus compounds and their use as insecticides. 4,132,784, Cl. 424-200.000.

Manchem Limited: *See*—
Turner, John H. W., 4,132,724, Cl. 260-448.0AD.

Mannesmann Aktiengesellschaft: *See*—
Schrewe, Hans; and Pleschiutschnigg, Fritz P., 4,132,003, Cl. 33-182.000.

Manno Kogyo Company, Limited: *See*—
Iida, Hiroshi, 4,132,124, Cl. 74-473.00R.

Manske, Wendell J.; and Hawkins, Paul M., to Minnesota Mining and Manufacturing Company. Freeze indicating device. 4,132,186, Cl. 116-216.000.

Manufacturing Technology, Inc.: *See*—
Kucklick, Frederick C., 4,132,340, Cl. 228-113.000.

Maple, T. Grant, to Lockheed Missiles & Space Company, Inc. Absorbing inhomogeneous film for high contrast display devices. 4,132,919, Cl. 313-466.000.

Marans, Nelson S.; and Pollack, Alan R., to W. R. Grace & Co. Biodegradable hydrophilic foams and method. 4,132,839, Cl. 521-159.000.

Margolin, Herbert E., to Germaine Monteil Cosmetiques Corp. Make-up container construction. 4,132,306, Cl. 206-37.000.

Marine Construction & Design Co.: *See*—
Tison, Kenneth F., 4,132,025, Cl. 43-4.000.

Marion Darrah and Joseph Y. Houghton, Co-trustees: *See*—
Burke, Oliver W., Jr., deceased; and Humphreys, Victor T., 4,132,562, Cl. 106-308.00M.

Marquis, David M.: *See*—
Katsumoto, Kiyoshi; and Marquis, David M., 4,132,670, Cl. 252-437.000.

Marquisee, Mark J.; and Sandell, Lionel S., to Du Pont de Nemours, E. I., and Company. Pigmented microporous silica microspheres. 4,132,560, Cl. 106-288.00B.

Marshall, Edward W.: *See*—
Escriva, Vincent R.; Kirtikar, Suvrat; Marshall, Edward W.; and Minard, Charles D., 4,131,986, Cl. 29-592.00R.

Martin, John H. E. J.: *See*—
Hertz, Martin R.; and Martin, John H. E. J., 4,132,779, Cl. 424-122.000.

Martin, Robert J., III, to General Electric Company. Squelch circuit for a radio receiver. 4,132,953, Cl. 325-478.000.

Martin, Tellis A.; and Comer, William T., to Mead Johnson & Company. Benzoic acid derivative and benzenesulfonic acid mucolytic process. 4,132,802, Cl. 424-303.000.

Martin, Tellis A., to Mead Johnson & Company. Mercaptoacylamidobenzoylglycine mucolytic process and compositions. 4,132,803, Cl. 424-316.000.

Marumiya Shoko Co., Ltd.: *See*—
Miyamoto, Eiji, 4,132,138, Cl. 83-697.000.

Marvin Glass & Associates: *See*—
Breslow, Jeffrey D.; and Hicks, Alan A., 4,132,411, Cl. 273-119.00R.
Hicks, Alan A.; and Disko, Harry, 4,132,155, Cl. 93-1.00G.

Masaki, Kenji; and Okamura, Kenji, to Nissan Motor Company, Limited. Air-fuel mixture control system. 4,132,198, Cl. 123-119.0LR.

Maschmeyer, Richard O.: *See*—
Eolin, Robert W.; Foster, Gordon F.; Mach, Joseph F.; and Maschmeyer, Richard O., 4,132,538, Cl. 65-32.000.

Massachusetts Institute of Technology: *See*—
Kaplow, Roy; and Frank, Robert I., 4,131,984, Cl. 29-572.000.
Plotkin, George M.; and Wolf, George, 4,132,600, Cl. 195-103.50R.

Massey-Ferguson Services N.V.: *See*—
Todeschini, Eugenio, 4,132,278, Cl. 180-6.480.

Masson Scott Thrissell Engineering Ltd.: *See*—
Byrt, Graham A. B., 4,132,371, Cl. 242-58.300.

Mast, Donald R.: *See*—
Dezelan, Joseph E.; and Mast, Donald R., 4,132,290, Cl. 188-69.000.

Mastak, Ned J., to Acme Conveyor Company. Method and apparatus for removing articles from between load patterns in a bulk palletizer. 4,132,305, Cl. 198-432.000.

Masuda, Akiyoshi; and Nambu, Tetsuo, to Nippon Tensai Seito Kabushiki Kaisha. Continuous paper cylinder assembly and method of separating the same and transplanting apparatus for the same. 4,132,337, Cl. 225-5.000.

Masuda, Hiroo; Kubo, Masaharu; and Hori, Ryoichi, to Hitachi, Ltd. MOS type field effect transistor. 4,132,997, Cl. 357-23.000.

Masuda, Michio: *See*—
Yamada, Hirofumi; Takaki, Noboru; and Masuda, Michio, 4,132,590, Cl. 162-145.000.

Masuda, Noboru; and Sugimoto, Shoichi, to Denki Onkyo Company, Limited. Potentiometer. 4,132,970, Cl. 338-32.00R.

Mathias, Eckart, to W. R. Grace & Co. Photocurable imidizable polyene-polythiol compositions. 4,132,812, Cl. 427-44.000.

Mathys, Pierre, to Bouchet-Lassale S.A. Watch movement. 4,132,061, Cl. 58-59.000.

Matsubara, Sadakazu: *See*—
Kurozumi, Seizi; Toru, Takeshi; Tanaka, Toshio; Miura, Shuzi; Kobayashi, Makiko; Ishimoto, Sachio; and Matsubara, Sadakazu, 4,132,726, Cl. 260-448.80R.

Matsuda, Tatsuichi: *See*—
Nomura, Hiroaki; Hitaka, Takenori; Akimoto, Hiroshi; Minami, Isao; Kiriki, Fumio; Matsuda, Tatsuichi; and Fugono, Takeshi, 4,132,789, Cl. 424-246.000.

Matsufuji, Akira: *See*—
Nakamura, Shoji; Nakamoto, Yasuyuki; Yamamoto, Youshun; Matsufuji, Akira; Haji, Takashi; and Nakama, Akihiro, 4,132,393, Cl. 266-117.000.

Matsukawa, Hiroharu: *See*—
Hosoi, Noriyuki; Ogata, Yasuhiro; and Matsukawa, Hiroharu, 4,132,112, Cl. 73-141.00R.

Matsumura, Isao, to Canon Kabushiki Kaisha. Ophthalmoscopic optical system. 4,132,466, Cl. 351-7.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Takamiya, Takehisa; Yano, Yoshiro; and Nakamura, Yuji, 4,133,012, Cl. 360-90.000.

Matthey, Pierre: *See*—
Crespy, Guy; Matthey, Pierre; and Gutjahr, Manfred A., 4,132,606, Cl. 204-2.100.

Matveev, Mikhail S.: *See*—
Nametkin, Nikolai S.; Matveev, Mikhail S.; Gubin, Sergei P.; Dekhterman, Abram S.; Tjurin, Vladimir D.; Skibenko, Anatoly P.; Orlova, Valentina S.; Savenko, Alevtina I.; and Podolskaya, Irina P., 4,132,631, Cl. 208-236.000.

Matzen, Walter T., to Texas Instruments Incorporated. Adjustment of avalanche voltage in DIFMOS memory devices by control of impurity doping. 4,131,983, Cl. 29-571.000.

Maxi-Switch Company: *See*—
Fisher, Robert P., 4,132,487, Cl. 400-479.100.

Mazzamauro, Robert: *See*—
Hart, Robert D.; and Mazzamauro, Robert, 4,132,986, Cl. 340-373.000.

McClellan, Bingham A., to McClellan Industries, Inc. Releasable clamp for elongated objects such as fishing rods. 4,132,381, Cl. 248-316.00R.

McClellan Industries, Inc.: *See*—
McClellan, Bingham A., 4,132,381, Cl. 248-316.00R.

McConnell, William C., to PPG Industries, Inc. Azide-metal salt formulations for control of fungi and nematodes. 4,132,780, Cl. 424-127.000.

McCoy, Raymond D., to Phillips Petroleum Company. Hydrocarbon cracking. 4,132,629, Cl. 208-113.000.

McCurry, Jere L. System to supplement engine power. 4,132,283, Cl. 180-66.00R.

McDermott, Hugh L., to Eaton Corporation. Crowned involute splines and method of making. 4,132,090, Cl. 64-9.00R.

McDorman, Robert L., Sr. Security device for trailer coupling pin. 4,132,093, Cl. 70-231.000.

McGann, Rodney, to Texaco Inc. Production of H_2 and co-containing gas stream and power. 4,132,065, Cl. 60-39.020.

McGee, James R. Animal carcass transporting device. 4,132,427, Cl. 280-19.000.

McGinnis, Edgar L.: *See*—
Carr, Norman L.; and McGinnis, Edgar L., 4,132,630, Cl. 208-177.000.

McGrath, Robert L. Service connection between a main and a meter in a building and method of and equipment for installing the same. 4,132,083, Cl. 405-184.000.

McInerney, Eugene F.: *See*—
Loprest, Frank J.; and McInerney, Eugene F., 4,132,549, Cl. 96-35.000.

McKerrell, Alistair A.: *See*—
Eadie, Brian K. M.; Craighead, James W.; McKerrell, Alistair A.; Wilson, Robert; and White, William A., 4,132,058, Cl. 57-125.000.

McLaughlin, Phillip M.: *See*—
Holloway, Gale A.; Lark, Wayne W.; McLaughlin, Phillip M.; and Mortonson, Robert M., 4,132,272, Cl. 172-2.000.

McNeil Laboratories, Inc.: *See*—
Mohrbacher, Richard J.; Ho, Winston; and Tutwiler, Gene F., 4,132,720, Cl. 260-348.610.
Wong, Stewart, 4,132,788, Cl. 424-232.000.

McNeilab Inc.: *See*—
Mohrbacher, Richard J.; Ho, Winston; and Tutwiler, Gene F., 4,132,719, Cl. 260-348.480.

Mead Johnson & Company: *See*—
Martin, Tellis A.; and Comer, William T., 4,132,802, Cl. 424-303.000.
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Wu, Yao H.; and Lobeck, Walter G., Jr., 4,132,794, Cl. 424-257.000.

Medtronic, Inc.: *See*—
Hartlaub, Jerome T., 4,132,233, Cl. 128-419.0PG.

Meiller, Francois; and Mirabel, Bernard, to Rhone Poulenc Industries. Support-aminoacylase complexes. 4,132,596, Cl. 195-63.000.

Meistring, Rolf; Rudolf, Karl; Schmid, Werner; and Zeyher, Fritz, to Messerschmitt-Bolkow-Blohm GmbH. Expellable reaction mass for recoilless projectile launchers. 4,132,148, Cl. 89-1.701.

Mercer, Benjamin, Jr.: *See*—
Frederick, Judson G.; Mercer, Benjamin, Jr.; and Poole, John E., 4,132,191, Cl. 118-409.000.
Mercier, Denis L., to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull. Systems for recognizing printed characters. 4,132,978, Cl. 340-146.3ED.
Merck & Co., Inc.: *See*—
Remy, David C., 4,132,796, Cl. 424-267.000.
Shepard, Kenneth L.; and Paleveda, William J., Jr., 4,132,799, Cl. 424-272.000.
Merges, John C., Jr., to Sun Oil Company of Pennsylvania. Molding processes for making multilayer containers of different materials. 4,132,591, Cl. 162-146.000.
Merix Corporation: *See*—
Mix, Thomas W., 4,132,761, Cl. 423-242.000.
Merjan, Stanley. Piling. 4,132,082, Cl. 405-253.000.
Merritt, Robert C., to Eaton Corporation. Metering valve for fuel injection. 4,132,205, Cl. 123-139.0BC.
Messerschmitt-Bolkow-Blohm GmbH: *See*—
Hahn, Hans-Jurgen, 4,132,825, Cl. 428-311.000.
Meistring, Rolf; Rudolf, Karl; Schmid, Werner; and Zeyher, Fritz, 4,132,148, Cl. 89-1.701.
Metcher, Siegfried: *See*—
Bianchi, Valerio; Metcher, Siegfried; Latsch, Reinhard; Weidner, Hans; and Brettschneider, Johannes, 4,132,195, Cl. 123-32.0EA.
Michaels, John M.: *See*—
Croopnick, Gerald A.; Michaels, John M.; and Paul, Donald G., 4,132,649, Cl. 210-347.000.
Michigan Technological University: *See*—
Yang, David C., 4,132,635, Cl. 209-166.000.
Micro Peripherals, Inc.: *See*—
Sidhu, Pawitter S., 4,132,954, Cl. 328-165.000.
Midcon Pipeline Equipment Co.: *See*—
Clavin, Edward A., 4,132,104, Cl. 72-342.000.
Mikaila, Joseph J., to United States of America, Army. Fragment prevention screen for explodable fire suppressant panels. 4,132,271, Cl. 169-62.000.
Milde, Wilhelm; and Hoheisel, Gerhard, to Volkswagenwerk Aktiengesellschaft. Connecting line within an exhaust system of a motor vehicle. 4,132,285, Cl. 181-258.000.
Miles Laboratories, Inc.: *See*—
Kluender, Harold C.; Woessner, Warren D.; and Biddlecom, William G., 4,132,738, Cl. 260-586.00R.
Millar, Frederick W., to Access Control Systems Pty. Ltd. Door lock apparatus. 4,132,439, Cl. 292-144.000.
Miller, Henry F.; Borts, Abraham; and Weiss, Folker H., to Lockheed Missiles & Space Company, Inc. Buoyant fluid separation device. 4,132,648, Cl. 210-242.00R.
Miller, Howard N.; and Segar, William R., to Westinghouse Electric Corp. Switching apparatus for mass transit vehicle. 4,132,175, Cl. 104-130.000.
Miller, Russell N.: *See*—
Hyde, Paul E.; and Miller, Russell N., 4,132,362, Cl. 239-453.000.
Mills, Thomas O. Machine for notching pallet stringers. 4,132,253, Cl. 144-133.00R.
Milutziki, Udo: *See*—
Gaus, Harry; Johnson, Jeffrey; Milutziki, Udo; and Schotte, Dietwald, 4,132,935, Cl. 318-480.000.
Minami, Isao: *See*—
Nomura, Hiroaki; Hitaka, Takenori; Akimoto, Hiroshi; Minami, Isao; Kiriki, Fumio; Matsuda, Tatsuichi; and Fugono, Takeshi, 4,132,789, Cl. 424-246.000.
Minard, Charles D.: *See*—
Escriva, Vincent R.; Kirtikar, Suvrat; Marshall, Edward W.; and Minard, Charles D., 4,131,986, Cl. 29-592.00R.
Minkov, Jury V.: *See*—
Gafarov, Palmir M.; Minkov, Jury V.; and Solomonenko, Vladimir I., 4,133,048, Cl. 365-208.000.
Minnesota Mining and Manufacturing Company: *See*—
Manske, Wendell J.; and Hawkins, Paul M., 4,132,186, Cl. 116-216.000.
Nidelkoff, James G., 4,132,020, Cl. 40-606.000.
Minolta Camera Kabushiki Kaisha: *See*—
Kitaura, Mashio, 4,132,985, Cl. 340-347.0AD.
Nagai, Koji; Iwatsuki, Haruki; Inagaki, Sanji; and Kameda, Hiromi, 4,132,548, Cl. 96-1.0TE.
Ohta, Yoshiharu; and Hosomizu, Hiroshi, 4,132,926, Cl. 315-241.00P.
Suzuki, Tomio, 4,132,475, Cl. 355-3.00R.
Ueda, Hiroshi; Miyamoto, Takayoshi; and Niwa, Masatake, 4,132,474, Cl. 354-234.000.
Mirabel, Bernard: *See*—
Meiller, Francois; and Mirabel, Bernard, 4,132,596, Cl. 195-63.000.
Mise, Keisuke: *See*—
Hiroshima, Minoru; Yoshizawa, Shigeru; Saito, Nobuo; Asano, Atsushi; Suehiro, Hiroshi; Saitoh, Minoru; and Mise, Keisuke, 4,133,043, Cl. 365-15.000.
Miskolczi, Laszlo: *See*—
Kiss, Laszlo; Csillag, Laszlo; Halmai, Karoly; and Miskolczi, Laszlo, 4,132,910, Cl. 310-12.000.
Missioux, Jean L. Machine for forming helicoidal springs. 4,132,094, Cl. 72-7.000.
Mitoff, Stephan P., to General Electric Company. Composite body with beta-alumina substrate and glass-coating thereon. 4,132,820, Cl. 428-65.000.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Hanawa, Akio; Miyamura, Noriyuki; and Oosugi, Yasuhiro, 4,132,197, Cl. 123-75.00B.
Mitsui Mining & Smelting Co., Ltd.: *See*—
Saitoh, Kozo; and Izumi, Sumio, 4,132,633, Cl. 209-9.000.
Miura, Shuzi: *See*—
Kurozumi, Seizi; Toru, Takeshi; Tanaka, Toshio; Miura, Shuzi; Kobayashi, Makiko; Ishimoto, Sachio; and Matsubara, Sadakazu, 4,132,726, Cl. 260-448.80R.
Miura, Takao: *See*—
Chikatsu, Tatsusuke; Shimokawa, Shinichi; Miura, Takao; and Okumura, Taro, 4,132,666, Cl. 252-309.000.
Mix, Thomas W., to Merix Corporation. Gas-liquid contacting. 4,132,761, Cl. 423-242.000.
Miyamoto, Eiji, to Marumiya Shoko Co., Ltd. Cutter for a cutting machine. 4,132,138, Cl. 83-697.000.
Miyamoto, Takayoshi: *See*—
Ueda, Hiroshi; Miyamoto, Takayoshi; and Niwa, Masatake, 4,132,474, Cl. 354-234.000.
Miyamura, Noriyuki: *See*—
Hanawa, Akio; Miyamura, Noriyuki; and Oosugi, Yasuhiro, 4,132,197, Cl. 123-75.00B.
Mobile Oil Corporation: *See*—
Gournay, Luke S.; Harrell, John W.; and Dennis, Charles L., 4,132,943, Cl. 324-6.000.
Modica, Giovanni: *See*—
Giuffre, Luigi; Spaziante, Placido M.; Pozzi, Vittorio; and Modica, Giovanni, 4,132,819, Cl. 427-341.000.
Modrovich, Ivan E. Stabilized liquid phosphate containing diagnostic compositions and method of preparing same. 4,132,598, Cl. 195-99.000.
Moebius, Ulrich. Manual device for indicating scores. 4,132,187, Cl. 116-225.000.
Mohrbacher, Richard J.; Ho, Winston; and Tutwiler, Gene F., to McNeilab Inc. Dibromoalkylglycidic acid derivatives. 4,132,719, Cl. 260-348.480.
Mohrbacher, Richard J.; Ho, Winston; and Tutwiler, Gene F., to McNeil Laboratories, Inc. Alkenylglycidic acid derivatives. 4,132,720, Cl. 260-348.610.
Mollere, John C., to Hercules Incorporated. Method for seismic marine survey. 4,132,974, Cl. 340-7.00R.
Molloy, Bryan B., to Eli Lilly and Company. Trifluoromethyl substituted 1-aminoindanes. 4,132,737, Cl. 260-578.000.
Monroe, Darrell W.: *See*—
Key, William P.; Ihrig, David C.; and Monroe, Darrell W., 4,132,637, Cl. 210-7.000.
Monsanto Company: *See*—
Baizer, Manuel M.; Goodin, Richard D.; and Hallcher, Richard C., 4,132,611, Cl. 204-59.00R.
Singleton, Thomas C., 4,132,734, Cl. 562-522.000.
Smith, Andrew I.; and Wu, Wen-li, 4,132,757, Cl. 264-210.00F.
Monser, George J., to Raytheon Company. Cavity backed slot antenna. 4,132,995, Cl. 343-767.000.
Monser, George J.: *See*—
Ehrhardt, John R.; and Monser, George J., 4,132,993, Cl. 343-705.000.
Montagna, Anthony R. Ring toss game with swivel collar. 4,132,410, Cl. 273-100.000.
Montedison S.p.A.: *See*—
Bottaccio, Giorgio; Campolmi, Stefano; and Felicioli, Maria G., 4,132,732, Cl. 562-550.000.
Montefibre S.p.A.: *See*—
Camprincoli, Pierpaolo; and Rosati, Luciano, 4,132,556, Cl. 106-90.000.
Moore, Earl P., Jr., to Du Pont de Nemours, E. I., and Company. Purification of 2-amino-2,4-dimethyl-4-methoxy pentanenitrile. 4,132,729, Cl. 260-465.50R.
Moore Industries: *See*—
Moore, Leonard W.; Bodle, Ronald L.; and Fiederer, Conrad, 4,133,022, Cl. 361-415.000.
Moore, James H.: *See*—
Ore, Fernando; Ellis, John D.; and Moore, James H., 4,132,760, Cl. 423-167.000.
Moore, Leonard W.; Bodle, Ronald L.; and Fiederer, Conrad, to Moore Industries. Rack assembly. 4,133,022, Cl. 361-415.000.
Moore, Randall W.: *See*—
Hottel, Hoyt C., Jr.; Brown, Robert A.; Moore, Randall W.; and Sullivan, Paul F., 4,132,462, Cl. 350-117.000.
Moore, Robert M.: *See*—
Busanovich, Charles J.; and Moore, Robert M., 4,132,918, Cl. 313-386.000.
Moran, Robert J.: *See*—
Brown, William T.; Moran, Robert J.; and LeBlanc, Larry M., 4,132,250, Cl. 140-115.000.
Moraw, Roland; and Schadlich, Gunther, to Hoechst Aktiengesellschaft. Method and apparatus for recording and optically reproducing X-ray images. 4,132,893, Cl. 250-315.00A.
Moreau, Robert C.; and Fournier, Jean-Paul. N-Substituted 2-methoxybenzenesulphonamides and medicaments containing them. 4,132,786, Cl. 424-228.000.
Morel, Paul; Dugois, Jean-Pierre; and Langon, Bernard, to Aluminum Pechiney. Method of improving the current supply of electrolysis cells aligned in a lengthwise direction. 4,132,621, Cl. 204-243.00M.
Mori, Yasuki: *See*—
Tomioka, Shinji; Mori, Yasuki; and Shirahata, Kunikatsu, 4,132,846, Cl. 536-17.000.

Morimoto, Tomiaki: *See*—
Tohmatsu, Jun-ichi; Morimoto, Tomiaki; and Kishi, Emiko, 4,132,767, Cl. 424-1.000.
Morishita, Tsuyoshi: *See*—
Sunami, Teruo; Morishita, Tsuyoshi; and Hatakeyama, Kazumi, 4,132,419, Cl. 277-96.200.
Moronville, Chantal: *See*—
Jacques, Andre; d'Auria, Luigi; and Moronville, Chantal, 4,132,461, Cl. 350-96.200.
Morris, James B.: *See*—
Brandon, Ralph E.; Ring, Michael; and Morris, James B., 4,132,592, Cl. 162-216.000.
Morrison Medical Products Company: *See*—
Morrison, Robert D., 4,132,229, Cl. 128-134.000.
Morrison, Robert D., to Morrison Medical Products Company. Safety belt for restraining bed patients. 4,132,229, Cl. 128-134.000.
Morrison, Wilbur J.; and Tress, Norwood E., to Bell & Howell Company. Sheet feed monitor apparatus. 4,132,402, Cl. 271-263.000.
Morton, John; and Stevens, Keith D., to Cableform Limited. Electric motor driven vehicles. 4,132,934, Cl. 318-382.000.
Mortonson, Robert M.; and Holloway, Gale A., to International Harvester Company. Tractor hitch control system having safety features. 4,132,273, Cl. 172-2.000.
Mortonson, Robert M.: *See*—
Holloway, Gale A.; Lark, Wayne W.; McLaughlin, Phillip M.; and Mortonson, Robert M., 4,132,272, Cl. 172-2.000.
Motan Gesellschaft mit beschrankter Haftung: *See*—
Bongartz, Paul; and Haag, Franz, 4,132,509, Cl. 417-475.000.
Motorola, Inc.: *See*—
Allen, Gordon H., 4,132,906, Cl. 307-254.000.
Bowman, Ronald R., 4,132,550, Cl. 96-36.000.
Wurzburg, Henry, 4,133,025, Cl. 363-41.000.
Moulene, Daniel: *See*—
Golay, Bernard; and Moulene, Daniel, 4,133,005, Cl. 358-132.000.
Mowbray, Dorian F., to C.A.V. Limited. Fuel injection pumping apparatus. 4,132,508, Cl. 417-462.000.
Muanyagipari Kutato Intezet: *See*—
Kiss, Laszlo; Csillag, Laszlo; Halmai, Karoly; and Miskolczi, Laszlo, 4,132,910, Cl. 310-12.000.
Mueller, Floyd F.; and Gelbuda, William A., to American Hospital Supply Corporation. Shelf and corner post combination. 4,132,178, Cl. 108-144.000.
Mukaida, Yoshito; Fujiyama, Masaaki; Komine, Shigeo; Igarashi, Masaaki; Yamaguchi, Nobutaka; Iida, Shinobu; and Kasuga, Akira, to Fuji Photo Film Co., Ltd. Magnetic recording substance. 4,132,827, Cl. 428-329.000.
Muller, Hans; Buhler, Rudolf; and Rapsomanikis, Nikolas, to Chemap AG. Process for filtering a cellulose acetate solution. 4,132,642, Cl. 210-75.000.
Mullins, James N., Jr., to Polar Chips Manufacturing Co. Method and apparatus for bagging material. 4,132,049, Cl. 53-452.000.
Muramoto, Setsuo, to Kabushikikaisha Yokogawa Denki Seisakusho. Vibration type liquid density meter. 4,132,110, Cl. 73-32.00A.
Murase, Kenji: *See*—
Yamaguchi, Hisashi; Murase, Kenji; Ishizaki, Hiroyuki; and Kashiwara, Hirofumi, 4,132,924, Cl. 340-779.000.
Murata Manufacturing Co., Ltd.: *See*—
Kraft, Wolfgang, 4,132,573, Cl. 148-175.000.
Myers, Edward C.: *See*—
Yu, Albert P.; and Myers, Edward C., 4,132,632, Cl. 208-216.000.
Myers, Harry K., Jr.: *See*—
Lyons, James E.; Schneider, Abraham; and Myers, Harry K., Jr., 4,132,742, Cl. 260-668.00A.
N-S-W Corporation: *See*—
Wilmeth, Claude H., 4,132,136, Cl. 81-57.390.
Naf, Ferdinand, to Firmenich SA. cis-Oct-6-en-1-al perfumes. 4,132,675, Cl. 252-522.000.
Nagai, Koji; Iwatsuki, Haruki; Inagaki, Sanji; and Kameda, Hiromi, to Minolta Camera Kabushiki Kaisha. Process for reproducing images of fine lines or characters of low density. 4,132,548, Cl. 96-1.0TE.
Nagai, Tadashi: *See*—
Takase, Sadao; Asano, Masaharu; and Nagai, Tadashi, 4,132,193, Cl. 123-32.0EE.
Nagano, Humikazu, to Sharp Kabushiki Kaisha. Image information reading apparatus. 4,132,977, Cl. 340-146.3AG.
Nagano, Masashi; and Fujimoto, Hideaki, to Shimano Industrial Company Limited. Derailleur for a bicycle. 4,132,119, Cl. 74-217.00B.
Nagarajan, Ramakrishnan: *See*—
Gorman, Marvin; Higgens, Calvin E.; and Nagarajan, Ramakrishnan, 4,132,790, Cl. 424-246.000.
Nagase, Hiroshi: *See*—
Okuyama, Toshiaki; Kubota, Yuzuru; and Nagase, Hiroshi, 4,132,931, Cl. 318-732.000.
Naito, Hiromitsu: *See*—
Nitto, Hajime; and Naito, Hiromitsu, 4,132,342, Cl. 228-136.000.
Nakagawa, Yukio: *See*—
Sato, Minoru; Takahashi, Isao; Kurasawa, Takanao; Yoshioka, Yoshio; and Nakagawa, Yukio, 4,132,876, Cl. 200-148.00A.
Nakama, Akihiro: *See*—
Nakamura, Shoji; Nakamoto, Yasuyuki; Yamamoto, Youshun; Matsufuji, Akira; Haji, Takashi; and Nakama, Akihiro, 4,132,393, Cl. 266-117.000.
Nakamoto, Yasuyuki: *See*—
Nakamura, Shoji; Nakamoto, Yasuyuki; Yamamoto, Youshun; Matsufuji, Akira; Haji, Takashi; and Nakama, Akihiro, 4,132,393, Cl. 266-117.000.
Nakamura, Kazuo; Fukube, Yoshito; and Osaki, Takashi, to Toho Beslon Co., Ltd.; and Nihon Shinku Gijutsu Kabushiki Kaisha. Assembly of metal-coated carbon fibers, process for production thereof, and method for use thereof. 4,132,828, Cl. 428-366.000.
Nakamura, Shoji; Nakamoto, Yasuyuki; Yamamoto, Youshun; Matsufuji, Akira; Haji, Takashi; and Nakama, Akihiro, to Nippon Steel Corporation. Apparatus for cooling hot steel plate and sheet. 4,132,393, Cl. 266-117.000.
Nakamura, Yuji: *See*—
Takamiya, Takehisa; Yano, Yoshiro; and Nakamura, Yuji, 4,133,012, Cl. 360-90.000.
Nakanishi, Atsuo: *See*—
Izawa, Shinichi; Ohzeki, Jurou; Yahata, Tsuyoshi; and Nakanishi, Atsuo, 4,132,684, Cl. 260-4.0AR.
Nakayama, Kenji; and Yamanoi, Koji, to Diesel Kiki Co., Ltd. Variable drive coupling for a fuel injection pump. 4,132,202, Cl. 123-139.0AP.
Nalco Chemical Company: *See*—
Choca, Monica E.; and Feistel, Gerald R., 4,132,669, Cl. 252-435.000.
Nambu, Tetsuo: *See*—
Masuda, Akiyoshi; and Nambu, Tetsuo, 4,132,337, Cl. 225-5.000.
Nametkin, Nikolai S.; Matveev, Mikhail S.; Gubin, Sergei P.; Dekhterman, Abram S.; Tjurin, Vladimir D.; Skibenko, Anatoly P.; Orlova, Valentina S.; Savenko, Alevtina I.; and Podolskaya, Irina P. Process for petroleum refining. 4,132,631, Cl. 208-236.000.
Naramore, Raymond, to Xerox Corporation. Apparatus for aligning a stack of sheets. 4,132,400, Cl. 271-221.000.
Nash, Henry G.: *See*—
Bottomley, James C.; and Nash, Henry G., 4,132,645, Cl. 210-104.000.
National Can Corporation: *See*—
Zundel, Arthur P., 4,132,328, Cl. 220-267.000.
National Research Development Corporation: *See*—
Robson, Ernest G.; and Smith, George A. M., 4,132,017, Cl. 37-141.00R.
National Semiconductor Corporation: *See*—
Page, Ronald W., 4,132,963, Cl. 330-283.000.
Wilcox, Milton E., 4,132,964, Cl. 331-116.00R.
National Steel Corporation: *See*—
Bush, Glenn W.; and Austin, Lowell W., 4,132,609, Cl. 204-28.000.
Nauta, Robijn R.: *See*—
Verberne, Petrus; Zwitserloot, Wilhelmus R. M.; and Nauta, Robijn R., 4,132,566, Cl. 127-65.000.
Nehmsmann, Louis J., III: *See*—
Verdicchio, Robert J.; and Nehmsmann, Louis J., III, 4,132,657, Cl. 252-32.500.
Neiman S.A.: *See*—
Weber, Gunter, 4,132,151, Cl. 90-13.050.
Nelson, John A.: *See*—
Hutchison, Robert V.; and Nelson, John A., 4,132,856, Cl. 174-52.0PE.
Nelson, John E. Wire feed funnel. 4,132,665, Cl. 254-134.30R.
Nelson Research & Development Company: *See*—
Stoughton, Richard B., 4,132,781, Cl. 424-181.000.
Neptune Microfloc, Inc.: *See*—
Hyde, Paul E.; and Miller, Russell N., 4,132,362, Cl. 239-453.000.
Neroni, Peter J.; and Kleykamp, Donald L., to Dayco Corporation. Method of making polymeric flexible hose construction. 4,132,576, Cl. 156-143.000.
Nesterenko, Petr S.: *See*—
Andoniev, Sergei M.; Gritsuk, Lev D.; Gorbik, Anatoly S.; Kurganov, Viktor V.; Oleinik, Nikolai P.; Rivlin, Grigory I.; Stetsenko, Nikolai V.; Shamil, Jury P.; Smetanin, Jury G.; and Nesterenko, Petr S., 4,132,852, Cl. 13-32.000.
Newton, Ralph E.; and Nixon, Henry M., to Westinghouse Electric Corp. Gas-filled incandescent lamp with integral fuse assembly. 4,132,922, Cl. 315-73.000.
NGK Insulators Ltd.: *See*—
Sakuma, Hiroshi, 4,132,647, Cl. 210-230.000.
Nichols, John A., to Airtech Systems, Inc. Waste heat recycling system. 4,132,011, Cl. 34-86.000.
Nicol, Charles H., to Procter & Gamble Company, The. Detergent compositions having soil release properties. 4,132,680, Cl. 252-547.000.
Nidelkoff, James G., to Minnesota Mining and Manufacturing Company. Sign structure. 4,132,020, Cl. 40-606.000.
Nidola, Antonio; and Spaziante, Placido M., to Diamond Shamrock Technologies S.A. Electrocatalytic electrodes. 4,132,620, Cl. 204-242.000.
Niedecker, Herbert. Clip. 4,131,975, Cl. 24-30.50W.
Nielsen, Paul E. Container comprising a folded blank, and blank therefor. 4,132,345, Cl. 229-8.000.
Nielson, Richard H.: *See*—
Brock, Louis C.; and Nielson, Richard H., 4,131,954, Cl. 2-177.000.
Niemi, Antti. Method of constructing a continuously operable flotation concentration plant. 4,133,038, Cl. 364-502.000.
Nihon Radiator Co., Ltd.: *See*—
Hasui, Hiroshi; and Suyama, Eizo, 4,132,286, Cl. 181-265.000.
Nihon Shinku Gijutsu Kabushiki Kaisha: *See*—
Nakamura, Kazuo; Fukube, Yoshito; and Osaki, Takashi, 4,132,828, Cl. 428-366.000.
Niigata Engineering Co., Ltd.: *See*—
Iwase, Toshio; Hashimoto, Teruo; and Iguchi, Youko, 4,132,636, Cl. 210-6.000.
Niimura, Tsutomu: *See*—
Hongu, Masayuki; Niimura, Tsutomu; and Kawakami, Hiromi, 4,132,952, Cl. 325-459.000.

Nims, Jerry C.: *See*—
Lo, Allen K. W.; and Nims, Jerry C., 4,132,468, Cl. 353-7.000.
Nippon Electric Co., Ltd.: *See*—
Iinuma, Kazumoto, 4,133,006, Cl. 358-133.000.
Kobuke, Nobuhiko, 4,132,975, Cl. 340-146.1BA.
Shirato, Hajime, 4,133,049, Cl. 365-208.000.
Nippon Electric Kagoshima: *See*—
Kobayakawa, Masaki; Yawata, Kazufumi; Hirano, Kiyoshige; and Yamashita, Shigeru, 4,132,920, Cl. 313-497.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Amano, Takehisa, 4,132,139, Cl. 84-1.030.
Chibana, Masanobu, 4,132,140, Cl. 84-1.110.
Nippon Kogaku K.K.: *See*—
Kondo, Hidenobu, 4,132,473, Cl. 354-203.000.
Nippon Oil and Fats Co. Ltd.: *See*—
Saito, Shinroku; Sawaoka, Akira; and Araki, Masatada, 4,132,554, Cl. 106-55.000.
Nippon Soken, Inc.: *See*—
Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Yukiyasu; and Tanaka, Taro, 4,132,212, Cl. 123-191.00S.
Nippon Steel Corporation: *See*—
Nakamura, Shoji; Nakamoto, Yasuyuki; Yamamoto, Youshun; Matsufuji, Akira; Haji, Takashi; and Nakama, Akihiro, 4,132,393, Cl. 266-117.000.
Nitto, Hajime; and Naito, Hiromitsu, 4,132,342, Cl. 228-136.000.
Nippon Telegraph and Telephone Public Corporation: *See*—
Hiroshima, Minoru; Yoshizawa, Shigeru; Saito, Nobuo; Asano, Atsushi; Suehiro, Hiroshi; Saitoh, Minoru; and Mise, Keisuke, 4,133,043, Cl. 365-15.000.
Nippon Tensai Seito Kabushiki Kaisha: *See*—
Masuda, Akiyoshi; and Nambu, Tetsuo, 4,132,337, Cl. 225-5.000.
Nishiba, Kenzo, to Teijin Seiki Company Limited. Radial piston type hydraulic pump-motor. 4,132,154, Cl. 91-491.000.
Nishimiya, Torazo: *See*—
Kuroiwa, Hiroshi; Nishimura, Yutaka; Ohyama, Yoshishige; and Nishimiya, Torazo, 4,132,199, Cl. 123-119.0EC.
Nishimura, Yutaka: *See*—
Kuroiwa, Hiroshi; Nishimura, Yutaka; Ohyama, Yoshishige; and Nishimiya, Torazo, 4,132,199, Cl. 123-119.0EC.
Nissan Motor Company, Limited: *See*—
Asano, Masaharu; Aono, Shigeo; Hosaka, Akio; Ochiai, Kokichi; and Yamane, Michiyoshi, 4,132,200, Cl. 123-119.0EC.
Masaki, Kenji; and Okamura, Kenji, 4,132,198, Cl. 123-119.0LR.
Saito, Masaaki, 4,132,194, Cl. 123-32.0EA.
Shimizu, Kazuaki, 4,132,451, Cl. 303-116.000.
Takahashi, Fujio; and Tsujimura, Harutoshi, 4,132,434, Cl. 280-744.000.
Takase, Sadao; Asano, Masaharu; and Nagai, Tadashi, 4,132,193, Cl. 123-32.0EE.
Nitto, Hajime; and Naito, Hiromitsu, to Nippon Steel Corporation. Method for producing a steel strip by hot rolling. 4,132,342, Cl. 228-136.000.
Niwa, Masatake: *See*—
Ueda, Hiroshi; Miyamoto, Takayoshi; and Niwa, Masatake, 4,132,474, Cl. 354-234.000.
Nixon, Henry M.: *See*—
Newton, Ralph E.; and Nixon, Henry M., 4,132,922, Cl. 315-73.000.
Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Yukiyasu; and Tanaka, Taro, to Nippon Soken, Inc. Torch-ignition internal combustion engine. 4,132,212, Cl. 123-191.00S.
Nolan, James J.: *See*—
Austin, George W., Jr.; Breton, Robert A.; Nolan, James J.; and Striebel, Edmund E., 4,132,066, Cl. 60-39.650.
Nomura, Hiroaki; Hitaka, Takenori; Akimoto, Hiroshi; Minami, Isao; Kiriki, Fumio; Matsuda, Tatsuichi; and Fugono, Takeshi, to Takeda Chemical Industries, Ltd. 7-[2-(2-Imino-4-thiazolin-4-yl)-2-sulfoacetamido]cephalosporins and antibacterial compositions containing them. 4,132,789, Cl. 424-246.000.
Noordermeer, Cornelis J.; and Maas, Johannes, to Observator B.V. Dredge profile computer for a cutter suction dredge. 4,133,033, Cl. 364-424.000.
Noranda Mines Limited: *See*—
Kerfoot, Derek G. E., 4,132,667, Cl. 252-387.000.
Northemann, Karl-Heinz; and Krahn, Heinrich. Toothbrush. 4,131,967, Cl. 15-167.00A.
Northern Engraving Company, Inc.: *See*—
Riniker, James P., 4,131,991, Cl. 29-622.000.
Norton Company: *See*—
Blodgett, Gary C.; and Powers, George H., 4,132,886, Cl. 219-523.000.
Norton, Richard V., to Suntech, Inc. Process for preparing nitriles. 4,132,711, Cl. 546-286.000.
Noshiro, Atsumi: *See*—
Kubota, Tetsuo; Noshiro, Atsumi; and Suzuki, Norimoto, 4,132,350, Cl. 235-493.000.
Noz, Francis X., to Galentan, A.G. Apparatus for continuous application of strip-, ribbon- or patch-shaped coatings to a metal tape. 4,132,617, Cl. 204-206.000.
Nozawa, Takamitsu, to Yoshino Kogyosho Co., Ltd. Manually operative atomizer. 4,132,359, Cl. 239-333.000.
Nutz, Karl-Diether, to Licentia Patent-Verwaltungs-G.m.b.H. Zero axis crossing detector. 4,132,909, Cl. 307-354.000.
N.V. Optische Industrie "De Oude Delft": *See*—
Groeneweg, Abraham, 4,132,889, Cl. 250-213.0VT.
Oakley, Charles B.: *See*—
Flory, Robert E.; and Oakley, Charles B., 4,133,003, Cl. 358-51.000.
Obata, Keigo: *See*—
Dohi, Nobuyasu; and Obata, Keigo, 4,132,610, Cl. 204-43.00S.
Observator B.V.: *See*—
Noordermeer, Cornelis J.; and Maas, Johannes, 4,133,033, Cl. 364-424.000.
Occidental Oil Shale, Inc.: *See*—
Hutchins, Ned M.; Enyeart, J. Walter; and Holbrook, Leon G., 4,132,172, Cl. 102-30.000.
Occidental Petroleum Corporation: *See*—
Ore, Fernando; Ellis, John D.; and Moore, James H., 4,132,760, Cl. 423-167.000.
Oce-van der Grinten N.V.: *See*—
Weyers, Jacobus R. M. G.; and Burm, Gabriel A. M., 4,132,192, Cl. 118-658.000.
Ochiai, Kokichi: *See*—
Asano, Masaharu; Aono, Shigeo; Hosaka, Akio; Ochiai, Kokichi; and Yamane, Michiyoshi, 4,132,200, Cl. 123-119.0EC.
O'Connor, Thomas J., to Easco-Sparcatron, Inc. Cutting master and method of making cutting master for erosion machining. 4,132,038, Cl. 51-204.000.
Offermann, Paul F., to Chevron Research Company. Method and means for segmentally reducing heat output in a heat-tracing pipe. 4,132,884, Cl. 219-300.000.
Officine Meccaniche Veronesi (O.M.V.)S.p.A.: *See*—
Padovani, Pietro, 4,132,319, Cl. 214-1.0BB.
Ogata, Yasuhiro: *See*—
Hosoi, Noriyuki; Ogata, Yasuhiro; and Matsukawa, Hiroharu, 4,132,112, Cl. 73-141.00R.
Ogawa, Iwakichi, to Takara Co., Ltd. Reconfigurable toy with optical elements. 4,132,028, Cl. 46-17.000.
Ogawa, Shinsaku, to Asahi Kasei Kogyo Kabushiki Kaisha. Concentration process by multistage, multiple effect evaporator. 4,132,588, Cl. 159-47.00R.
Ogden, Cameron A.: *See*—
Tench, Dennis M.; and Ogden, Cameron A., 4,132,605, Cl. 204-1.00T.
Ohira, Makoto: *See*—
Watabe, Rokuro; Ohira, Makoto; and Sakai, Katsuo, 4,132,477, Cl. 355-11.000.
Ohlson, Carl-Eric: *See*—
Ohlson, Eric; and Ohlson, Carl-Eric, 4,132,897, Cl. 250-468.000.
Ohlson, Eric; and Ohlson, Carl-Eric. Film-cassette holder for an x-ray apparatus. 4,132,897, Cl. 250-468.000.
Ohno, Takashi: *See*—
Shigemasa, Junichiro; Ohno, Takashi; and Tachikawa, Sadao, 4,132,899, Cl. 250-577.000.
Ohta, Yoshiharu; and Hosomizu, Hiroshi, to Minolta Camera Kabushiki Kaisha. Electronic flash devices. 4,132,926, Cl. 315-241.00P.
Ohyama, Yoshishige: *See*—
Kuroiwa, Hiroshi; Nishimura, Yutaka; Ohyama, Yoshishige; and Nishimiya, Torazo, 4,132,199, Cl. 123-119.0EC.
Ohzeki, Jurou: *See*—
Izawa, Shinichi; Ohzeki, Jurou; Yahata, Tsuyoshi; and Nakanishi, Atsuo, 4,132,684, Cl. 260-4.0AR.
Okamoto, Kouji: *See*—
Urry, Dan W.; and Okamoto, Kouji, 4,132,746, Cl. 260-857.0TW.
Okamura, Kenji: *See*—
Masaki, Kenji; and Okamura, Kenji, 4,132,198, Cl. 123-119.0LR.
Okumura, Taro: *See*—
Chikatsu, Tatsusuke; Shimokawa, Shinichi; Miura, Takao; and Okumura, Taro, 4,132,666, Cl. 252-309.000.
Okuyama, Toshiaki; Kubota, Yuzuru; and Nagase, Hiroshi, to Hitachi, Ltd. Control system for a.c. motors. 4,132,931, Cl. 318-732.000.
Oldenkamp, Engbert P.: *See*—
van Os, Jan L.; Oldenkamp, Engbert P.; and Smink, Dirk A., 4,132,777, Cl. 424-119.000.
Oleinik, Nikolai P.: *See*—
Andoniev, Sergei M.; Gritsuk, Lev D.; Gorbik, Anatoly S.; Kurganov, Viktor V.; Oleinik, Nikolai P.; Rivlin, Grigory I.; Stetsenko, Nikolai V.; Shamil, Jury P.; Smetanin, Jury G.; and Nesterenko, Petr S., 4,132,852, Cl. 13-32.000.
Olin Corporation: *See*—
Knollmueller, Karl O., 4,132,664, Cl. 252-78.300.
Olivieri, Icaro, to ICESLJ AG. Device for removably clamping a skate to the sole of a skating shoe. 4,132,424, Cl. 280-11.300.
Olson, Lloyd C.; and Cornelius, Gail, to R. M. Wade & Co. Drive means for irrigation system. 4,132,244, Cl. 137-344.000.
O'Neill, Daniel R.: *See*—
Painter, Alan; O'Neill, Daniel R.; and Glaeser, George L., Jr., 4,132,607, Cl. 204-9.000.
Ong, Sienling, to Hoechst Aktiengesellschaft. Process and agent for coloring cellulose containing blended fiber textiles. 4,132,523, Cl. 8-21.00R.
Onoda Cement Company, Limited: *See*—
Uchikawa, Hiroshi; and Shimoda, Masao, 4,132,558, Cl. 106-104.000.
Oosugi, Yasuhiro: *See*—
Hanawa, Akio; Miyamura, Noriyuki; and Oosugi, Yasuhiro, 4,132,197, Cl. 123-75.00B.
Ore, Fernando; Ellis, John D.; and Moore, James H., to Occidental Petroleum Corporation. Hemihydrate type phosphoric acid process using reduced pressure. 4,132,760, Cl. 423-167.000.
Orillion, Alfred G. Pyramidal solar heating system. 4,132,221, Cl. 126-271.000.

Orion Industries: *See*—
Aro, Ernesto M.; and Shanklin, Donald J., 4,132,091, Cl. 70-165.000.
Orlova, Valentina S.: *See*—
Nametkin, Nikolai S.; Matveev, Mikhail S.; Gubin, Sergei P.; Dekhterman, Abram S.; Tjurin, Vladimir D.; Skibenko, Anatoly P.; Orlova, Valentina S.; Savenko, Alevtina I.; and Podolskaya, Irina P., 4,132,631, Cl. 208-236.000.
Orme, Myrl E., to Bendix Corporation, The. Cable wiper assembly. 4,132,973, Cl. 340-3.00T.
Oronzio de Nora Impianti Elettrochimici S.p.A.: *See*—
Giuffre, Luigi; Spaziante, Placido M.; Pozzi, Vittorio; and Modica, Giovanni, 4,132,819, Cl. 427-341.000.
Ortlepp, Hans: *See*—
Hunkar, Denes B.; and Ortlepp, Hans, 4,132,152, Cl. 91-364.000.
Ortner Freight Car Company: *See*—
Funk, Stanley T., 4,132,177, Cl. 105-310.000.
Osaki, Takashi: *See*—
Nakamura, Kazuo; Fukube, Yoshito; and Osaki, Takashi, 4,132,828, Cl. 428-366.000.
Osther, Kurt B. Cancer antigen, cancer therapy, and cancer diagnosis. 4,132,769, Cl. 424-1.000.
Overman, Kelly C.; and Calder, Thelma L., to Westinghouse Electric Corp. System and method of performing a decisive phase coherence test. 4,133,037, Cl. 364-484.000.
Overton, David E.: *See*—
Slaats, Mathew A.; Overton, David E.; and Blessinger, James E., 4,132,483, Cl. 366-162.000.
Owen, Wickersham & Erickson: *See*—
Lindberg, John E., 4,132,247, Cl. 137-806.000.
Owens-Illinois, Inc.: *See*—
Byrum, Bernard W.; Ernsthausen, Roger E.; and Fein, Michael E., 4,132,982, Cl. 313-188.000.
Frederick, Judson G.; Mercer, Benjamin, Jr.; and Poole, John E., 4,132,191, Cl. 118-409.000.
Oxford, Keith E. Method of automatically monitoring and regenerating an etchant. 4,132,585, Cl. 156-626.000.
Pachmayr, Frank A.; and Farrar, Jack R., to Packmayr Gun Works, Inc. Cushioned pistol grip. 4,132,024, Cl. 42-71.00P.
Pacifico, Antonio: *See*—
Rescalli, Carlo; and Pacifico, Antonio, 4,132,739, Cl. 260-605.00S.
Packmayr Gun Works, Inc.: *See*—
Pachmayr, Frank A.; and Farrar, Jack R., 4,132,024, Cl. 42-71.00P.
Padovani, Pietro, to Officine Meccaniche Veronesi (O.M.V.)S.p.A. Automatic device for extracting stacks of finished hollow articles from a stacking station of a heat moulding apparatus. 4,132,319, Cl. 214-1.0BB.
Page, Ronald W., to National Semiconductor Corporation. Gain controlled signal amplifier. 4,132,963, Cl. 330-283.000.
Painter, Alan; O'Neill, Daniel R.; and Glaeser, George L., Jr., to Telex Computer Products, Inc. Process for forming a capstan. 4,132,607, Cl. 204-9.000.
Paleveda, William J., Jr.: *See*—
Shepard, Kenneth L.; and Paleveda, William J., Jr., 4,132,799, Cl. 424-272.000.
Palmer, Alan G.: *See*—
Tantram, Anthony D. S.; Kent, Michael J.; and Palmer, Alan G., 4,132,616, Cl. 204-195.00P.
Panzarella, James S., to Quaker Oats Company, The. Self-locking windlass. 4,132,389, Cl. 254-186.0HC.
Parant, Bernard; Cot, Louis; Granier, William; and Durand, Jean-Henri, to Diversey Corporation, The. Compositions for treatment of metallic surfaces by means of fluorophosphate salts. 4,132,572, Cl. 148-6.15R.
Parolini, Sammy H. Support assembly. 4,132,287, Cl. 182-45.000.
Parrish, Douglas R.: *See*—
Parrish, Richard A.; and Parrish, Douglas R., 4,132,457, Cl. 312-284.000.
Parrish, Richard A.; and Parrish, Douglas R. Protective cover for wedding cakes, or other display items. 4,132,457, Cl. 312-284.000.
Parzuchowski, Richard S.: *See*—
Benden, Robert S.; and Parzuchowski, Richard S., 4,132,816, Cl. 427-237.000.
Pastore, Ronald, to Cal Pak Industries, Inc. Clip mechanism and wall retention device for cup dispensing housing or similar article. 4,132,380, Cl. 248-224.100.
Patelli, Bianca: *See*—
Bernardi, Luigi; Giardino, Pietro; Patelli, Bianca; and Arcamone, Federico, 4,132,721, Cl. 260-365.000.
Patton, Ray F.: *See*—
Fono, Andrew; and Patton, Ray F., 4,132,522, Cl. 8-17.000.
Paul, Donald G.: *See*—
Croopnick, Gerald A.; Michaels, John M.; and Paul, Donald G., 4,132,649, Cl. 210-347.000.
Paul Journee, S.A.: *See*—
Journee, Maurice A., 4,132,490, Cl. 403-316.000.
Pavlik, Klaus J., to U.S. Philips Corporation. Method of producing a microwave filter comprising a body of gyromagnetic material and a source of a prepolarizing magnetic field whose resonant frequency is a predetermined function of the temperature. 4,131,987, Cl. 29-593.000.
Pawlak, Cathy J., administrator: *See*—
Pawlak, Daniel E., deceased; and Pawlak, Cathy J., administrator, 4,132,171, Cl. 102-28.00R.
Pawlak, Daniel E., deceased; and by Pawlak, Cathy J., administrator. Apparatus for detonating an explosive charge. 4,132,171, Cl. 102-28.00R.
Pawson, Beverly A., to Hoffmann-La Roche Inc. Substituted phenyl- or cyclohex-1-en-1-yl-3,7-demethyl-nona-2,4,6-trienoic acids and derivatives thereof. 4,132,723, Cl. 260-404.000.
Pell, Melvyn B., to Continental Oil Company; and United States of America, Energy. Method for recovering hydrocarbons from molten metal halides. 4,132,628, Cl. 208-108.000.
Penfold, Alan S.; and Thornton, John A., to Telic Corporation. Glow discharge method and apparatus. 4,132,612, Cl. 204-192.00R.
Penfold, Alan S.; and Thornton, John A., to Telic Corporation. Glow discharge method and apparatus. 4,132,613, Cl. 204-192.00R.
Periou, Pierre, to Compagnie Industrielle de Mecanismes. Method of manufacturing an electric motor. 4,131,989, Cl. 29-596.000.
Perkin-Elmer Limited: *See*—
Ford, Michael A.; and Jackson, David, 4,132,481, Cl. 356-325.000.
Perone, John T.: *See*—
Khoja, Mirza A.; Gutierrez, Louis F.; and Perone, John T., 4,132,349, Cl. 233-25.000.
Perrotti, Emmanuel J., to International Telephone and Telegraph Corporation. Radiator/circuit incorporating a cross slot waveguide antenna array which will instantaneously measure the radiation axial ratio or degree of linear polarization of any antenna. 4,132,992, Cl. 343-100.0PE.
Petermann, Walter E., to Carbo-Economy, S.A. Apparatus for providing a uniform combustible air-fuel mixture. 4,132,752, Cl. 261-40.000.
Peters, Klaus-Jurgen: *See*—
Wilfert, Thomas; Grassle, Alfred; and Peters, Klaus-Jurgen, 4,132,211, Cl. 123-179.00L.
Petersen, Mary A.: *See*—
Petersen, William; and Petersen, Mary A., 4,132,236, Cl. 135-16.000.
Petersen, William; and Petersen, Mary A. Tiltable collapsible umbrella and table combination. 4,132,236, Cl. 135-16.000.
Peterson, Earl C.; and Coolbroth, Frank P., to Sewage Osmosis Inc. Sewage osmosis system. 4,132,625, Cl. 204-299.00R.
Peterson, John O. H., to Scott Paper Company. Presensitized printing plate with in-situ, laser imagable mask. 4,132,168, Cl. 101-471.000.
Petitpierre, Jean C., to Ciba-Geigy Corporation. Production of chromenoindole compounds. 4,132,714, Cl. 260-326.50B.
Petrik, Konrad. Direct reading radius gauge. 4,132,001, Cl. 33-178.00D.
Pettengill, Ned H. Vehicle fuel injection system. 4,132,207, Cl. 123-141.000.
Petter, Hubert: *See*—
Bildstein, Hubert; Petter, Hubert; and Simader, Fritz, 4,132,917, Cl. 313-330.000.
Pfaff, Werner: *See*—
Hitzel, Volker; Weyer, Rudi; Pfaff, Werner; and Geisen, Karl, 4,132,795, Cl. 424-266.000.
Pfarr, Walter L., Jr., to Anchor Post Products, Inc. Gate and panel system. 4,132,390, Cl. 256-24.000.
Pfendler, Thomas: *See*—
Wocher, Berthold; Pfendler, Thomas; and Pfitzemaier, Heinz, 4,132,991, Cl. 343-13.00R.
Pfitzemaier, Heinz: *See*—
Wocher, Berthold; Pfendler, Thomas; and Pfitzemaier, Heinz, 4,132,991, Cl. 343-13.00R.
Pfizer Inc.: *See*—
Kuhla, Donald E.; and Plattner, Jacob J., 4,132,847, Cl. 542-441.000.
PHD, Inc.: *See*—
Grotness, Gunnar; and Boyer, Peter W., 4,132,153, Cl. 91-405.000.
Philagro S.A.: *See*—
Demozay, Daniel, 4,132,785, Cl. 424-218.000.
Philippaerts, Herman A.: *See*—
Pollet, Robert J.; Thiers, Robrecht J.; Ghys, Theofiel H.; Vandenberghe, Antoon L.; Philippaerts, Herman A.; and Vandenabeele, Hubert, 4,132,551, Cl. 96-66.500.
Phillips Petroleum Company: *See*—
Blackwell, Jennings P.; and Brady, Donnie G., 4,132,823, Cl. 428-215.000.
Cines, Martin R.; and Poska, Forrest L., 4,132,764, Cl. 423-415.00A.
McCoy, Raymond D., 4,132,629, Cl. 208-113.000.
Timberlake, Cecil H.; Viverette, Willie E., Jr.; and Davidson, John B., 4,132,443, Cl. 294-97.000.
Piaggio & C. S.p.A.: *See*—
Gaddi, Bruno, 4,132,281, Cl. 180-33.00C.
Piber, Earl T.: *See*—
Barcz, James P.; Bigelow, James H.; Jaeschke, James R.; Piber, Earl T.; and Spellman, Gordon B., 4,132,933, Cl. 318-346.000.
Picandet, Jean A.: *See*—
Coutard, Jean-Pierre G.; and Picandet, Jean A., 4,132,866, Cl. 179-15.0AQ.
Picciolo, Grace L.: *See*—
United States of America, National Aeronautics and Space Administration; Picciolo, Grace L.; Chappelle, Emmett W.; Deming, Jody W.; Shrock, Christian G.; Vellend, Hillar; Barza, Michael J.; and Weinstein, Louis, 4,132,599, Cl. 195-103.50K.
Piepers, Harry: *See*—
Warringa, Jozef J. M.; and Piepers, Harry, 4,132,965, Cl. 333-73.00R.
Pillsbury Company, The: *See*—
Standing, Charles N.; and Brandberg, Lawrence C., 4,132,811, Cl. 426-111.000.
Pinto, Robert R. Multiple hook-up, movable axle, container cargo trailer. 4,132,326, Cl. 214-515.000.

Pires, Antonio, to Sperry Rand Corporation. Smoothing comb for a hair trimmer. 4,131,995, Cl. 30-200.000.
Pitzalis, Mario: *See—*
Vargiu, Silvio; Pitzalis, Mario; Crespolini, Giancarlo; and Giuliani, Gino, 4,132,718, Cl. 260-348.150.
Plattner, Jacob J.: *See—*
Kuhla, Donald E.; and Plattner, Jacob J., 4,132,847, Cl. 542-441.000.
Plavskikh, Vladimir D.: *See—*
Tupitsyn, Konstantin K.; Cherednikov, Evgeny N.; Kostylev, Alexandr D.; Plavskikh, Vladimir D.; Klimashko, Vladimir V.; Tkach, Khaim B.; and Karavaev, Andron T., 4,132,277, Cl. 175-19.000.
Pleschiutschnigg, Fritz P.: *See—*
Schrewe, Hans; and Pleschiutschnigg, Fritz P., 4,132,003, Cl. 33-182.000.
Plessey Handel und Investments AG: *See—*
Skinner, Alexander; and Cook, Ronald G. T., 4,132,089, Cl. 64-2.00R.
PLM AB: *See—*
Carlsson, Carl-Goran H., 4,132,638, Cl. 210-7.000.
Plotkin, George M.; and Wolf, George, to Massachusetts Institute of Technology. Enzymatic noninvasive method for detecting cancer. 4,132,600, Cl. 195-103.50R.
Podolskaya, Irina P.: *See—*
Nametkin, Nikolai S.; Matveev, Mikhail S.; Gubin, Sergei P.; Dekhterman, Abram S.; Tjurin, Vladimir D.; Skibenko, Anatoly P.; Orlova, Valentina S.; Savenko, Alevtina I.; and Podolskaya, Irina P., 4,132,631, Cl. 208-236.000.
Poirier, J. Leon: *See—*
Blacksmith, Philipp; Poirier, J. Leon; and Holt, Frederick S., 4,132,988, Cl. 340-552.000.
Pokrovsky, Vladimir V.: *See—*
Arendt, Georgy A.; Pokrovsky, Vladimir V.; Burov, Boris A.; Lipovich, Alexandr L.; Romanov, Evgeny I.; Vainshtein, Galina L.; and Khaitovich, Tsalel S., 4,132,317, Cl. 212-49.000.
Polar Chips Manufacturing Co.: *See—*
Mullins, James N., Jr., 4,132,049, Cl. 53-452.000.
Polaroid Corporation: *See—*
Svatek, Thomas A.; and Wareham, Richard R., 4,132,471, Cl. 354-86.000.
Polasek, Peter: *See—*
Holdren, Earl J.; Polasek, Peter; and Krzys, Thaddeus W., Jr., 4,132,946, Cl. 324-73.00R.
Poli, Antonio. Braking disc with replaceable linings, for brake-discs. 4,132,294, Cl. 188-218.0XL.
Pollack, Alan R.: *See—*
Marans, Nelson S.; and Pollack, Alan R., 4,132,839, Cl. 521-159.000.
Pollet, Robert J.; Thiers, Robrecht J.; Ghys, Theofiel H.; Vandenberghe, Antoon L.; Philippaerts, Herman A.; and Vandenabeele, Hubert, to AGFA-GEVAERT N.V. High temperature processing of photographic silver halide material. 4,132,551, Cl. 96-66.500.
Polychrome Corporation: *See—*
Burkle, Stephen E.; and Deutsch, Albert S., 4,132,553, Cl. 96-91.00R.
Polymer Corporation, The: *See—*
Cottingham, Robert A., 4,131,964, Cl. 10-162.00R.
Poncet, Pierre. Automatic control of the level of a molten metal bath. 4,132,259, Cl. 164-4.000.
Poole, John E.: *See—*
Frederick, Judson G.; Mercer, Benjamin, Jr.; and Poole, John E., 4,132,191, Cl. 118-409.000.
Porta, Gary D., to AMP Incorporated. Electrical connections to coil windings. 4,132,460, Cl. 339-119.00R.
Porta Systems Corp.: *See—*
De Luca, Paul V.; Carney, William V.; and Louis, Arnold S., 4,132,814, Cl. 427-113.000.
Positive Pyramids, Inc.: *See—*
Thompson, Scott; and Chidester, James T., 4,132,029, Cl. 46-74.00D.
Poska, Forrest L.: *See—*
Cines, Martin R.; and Poska, Forrest L., 4,132,764, Cl. 423-415.00A.
Powell, Justin C.: *See—*
Cummings, William M.; and Powell, Justin C., 4,132,531, Cl. 44-63.000.
Powers, George H.: *See—*
Blodgett, Gary C.; and Powers, George H., 4,132,886, Cl. 219-523.000.
Pozzi, Vittorio: *See—*
Giuffre, Luigi; Spaziante, Placido M.; Pozzi, Vittorio; and Modica, Giovanni, 4,132,819, Cl. 427-341.000.
PPG Industries, Inc.: *See—*
Bissinger, William E., 4,132,801, Cl. 424-300.000.
Guzik, Frederick F., 4,132,800, Cl. 424-300.000.
Jeffries, William G., 4,132,539, Cl. 65-40.000.
McConnell, William C., 4,132,780, Cl. 424-127.000.
Wismer, Marco; and De Majistre, Robert, 4,132,822, Cl. 428-196.000.
Prashin, Anatoly A.: *See—*
Gurevich, Vladimir Z.; Prashin, Anatoly A.; Stoyakin, Vyacheslav P.; Ter-Minosian, Sergei M.; Frolov, Valery A.; Tolstykh, Viktor S.; Bogansky, Vasily V.; and Ivanenko, Gennady V., 4,132,339, Cl. 228-103.000.
Pratt, Albert R., to Raytheon Company. Wedge lock knob assembly. 4,132,129, Cl. 74-553.000.
Priem, Jan J.: *See—*
Van Paesschen, August J.; Van Gossum, Lucien J.; and Priem, Jan J., 4,132,552, Cl. 96-87.00R.
Priese, Werner K.; and Koehlert, Charles I., to Hills-McCanna Company. Electro-hydraulic controlled valve actuator system. 4,132,071, Cl. 60-328.000.
Primbsch, Erik, to Krautkramer-Branson, Incorporated. Ultrasonic energy receiver probe utilizing opto-electrical sensing. 4,132,117, Cl. 73-607.000.
Principe, Joseph R.: *See—*
Schreiber, Ronald S.; and Principe, Joseph R., 4,132,771, Cl. 424-52.000.
Pritula, Nina A.: *See—*
Gryaznov, Vladimir M.; Smirnov, Viktor S.; Vdovin, Valentin M.; Ermilova, Margarita M.; Gogua, Lia D.; Pritula, Nina A.; and Litvinov, Igor A., 4,132,668, Cl. 252-430.000.
Prober, Maurice: *See—*
Anderson, Harry C.; MacKenzie, Burton T., Jr.; Prober, Maurice; and Singh, Nirmal, 4,132,858, Cl. 174-120.0SR.
Procter & Gamble Company, The: *See—*
Nicol, Charles H., 4,132,680, Cl. 252-547.000.
Produits Chimiques Ugine Kuhlmann: *See—*
Champenois, Michel M. L., 4,132,841, Cl. 526-221.000.
Programmable Systems, Inc.: *See—*
Fisher, Robert M., 4,133,013, Cl. 360-92.000.
Psyras, Louis G. Aerodynamic toy with radial elevations on its convex side. 4,132,031, Cl. 46-228.000.
Puccio, Vincent. Injection device. 4,132,231, Cl. 128-218.00A.
Pugin, Andre: *See—*
L'Eplattenier, Francois; Pugin, Andre; and von der Crone, Jost, 4,132,708, Cl. 546-7.000.
Purzycki, Kenneth L.: *See—*
Shaffer, Gary W.; and Purzycki, Kenneth L., 4,132,677, Cl. 252-522.000.
Pye Limited: *See—*
Spurling, Alan M., 4,133,032, Cl. 364-424.000.
Q Corporation: *See—*
Albert, Eugene V., 4,132,137, Cl. 83-404.000.
Quakenbush, Howard M., to Flexsteel Industries, Inc. Convertible seat-bed. 4,131,960, Cl. 5-37.00R.
Quaker Oats Company, The: *See—*
Panzarella, James S., 4,132,389, Cl. 254-186.0HC.
Questech, Inc.: *See—*
Lyman, Harold T., Jr., 4,132,113, Cl. 73-178.00R.
Qume Corporation: *See—*
Hess, Ernst P., 4,132,485, Cl. 400-208.000.
R. M. Wade & Co.: *See—*
Olson, Lloyd C.; and Cornelius, Gail, 4,132,244, Cl. 137-344.000.
Raaniel Industries, Inc.: *See—*
Leinaar, Dennis J., 4,132,336, Cl. 224-42.130.
Rabinovich, Volf I.; Kriger, Jury N.; Svitenko, Igor A.; and Sapunov, Viktor E. Method of electroslag remelting processes using a pre-heated electrode shield. 4,132,545, Cl. 75-10.00C.
Rahmfeld, Werner: *See—*
Komma, Gerhard; Kothe, Dieter; and Rahmfeld, Werner, 4,132,261, Cl. 164-448.000.
Raidel, John E. Air ride suspension assemblies. 4,132,432, Cl. 280-711.000.
Raiff, Siegfried: *See—*
Koplin, Eckhard; Hoffmann, Horst; Raiff, Siegfried; Richter, Peter; and Kaufmann, Helmut, 4,132,235, Cl. 134-99.000.
Rambold, Thomas: *See—*
Ruckdeschel, Hermann; and Rambold, Thomas, 4,133,029, Cl. 364-200.000.
Ramer, James L. Solar heating for home use. 4,132,356, Cl. 237-1.00A.
Randall, Ross D., to Cameron Iron Works, Inc. Pipe shearing ram assembly for blowout preventer. 4,132,266, Cl. 166-55.000.
Randolph, Robert G. Durometer for indentible tissue and the like. 4,132,224, Cl. 128-2.00S.
Ranga, Egils. Sound reproducing apparatus. 4,132,859, Cl. 179-1.0GQ.
Rapicom Inc.: *See—*
Tisue, James G., 4,133,008, Cl. 358-282.000.
Rapsomanikis, Nikolas: *See—*
Muller, Hans; Buhler, Rudolf; and Rapsomanikis, Nikolas, 4,132,642, Cl. 210-75.000.
Rasmussen, Harry R., to Crest Industries, Inc. Hold control for a key telephone system. 4,132,860, Cl. 179-99.000.
Rauma-Repola Oy: *See—*
Makela, Markku, 4,132,289, Cl. 184-15.00R.
Rauscher, Dean C.; Grozier, Robert A.; and Rauscher, Frank J. Motor powered paste dispenser. 4,132,330, Cl. 222-76.000.
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Rauscher, Dean C.; Grozier, Robert A.; and Rauscher, Frank J., 4,132,330, Cl. 222-76.000.
Rausing, Ruben A., to Tetra Pak Developpement SA. Method for the manufacture of packing containers. 4,132,051, Cl. 53-452.000.
Raytheon Company: *See—*
Bowen, Robert F.; and Teich, Wesley W., 4,132,239, Cl. 137-382.000.
Ehrhardt, John R.; and Monser, George J., 4,132,993, Cl. 343-705.000.
Monser, George J., 4,132,995, Cl. 343-767.000.
Pratt, Albert R., 4,132,129, Cl. 74-553.000.
RCA Corporation: *See—*
Balaban, Alvin R.; and Steckler, Steven A., 4,132,927, Cl. 315-371.000.

Busanovich, Charles J.; and Moore, Robert M., 4,132,918, Cl. 313-386.000.
Dingwall, Andrew G. F., 4,132,998, Cl. 357-23.000.
Flory, Robert E.; and Oakley, Charles B., 4,133,003, Cl. 358-51.000.
Graham, Scott O., 4,132,903, Cl. 307-221.00D.
Groeneweg, Willem H., 4,133,002, Cl. 358-18.000.
Hampel, Daniel, 4,133,040, Cl. 364-773.000.

Reader, Kenneth R.; and Wilkerson, Joseph B., to United States of America, Navy. Controllable and programmable fluid flow modulation system. 4,132,500, Cl. 416-20.00R.

Realite Optical Company: *See—*
Rips, Irving, 4,132,518, Cl. 425-143.000.

Reddell, E. Garland. Tracking system for solar energy collector. 4,132,223, Cl. 126-271.000.

Reed, Clyde H., to Rohr Industries, Inc. Controlled porosity of uncured reinforced thermo-setting plastic material. 4,132,519, Cl. 425-174.200.

Reed, Robert A. Photographic mask structure. 4,132,480, Cl. 355-75.000.

Regnier, Gilbert; Canevari, Roger; and Desnoyers, Pierre, to Science Union et Cie. Pharmaceutical compositions containing a gamma-resorcylic acid derivative in the treatment of thrombosis. 4,132,787, Cl. 424-230.000.

Reighter, David H.: *See—*
Clark, Robert M.; Cronin, John C.; Reighter, David H.; and Tahiliani, Vasu H., 4,132,855, Cl. 174-28.000.

Remy, David C., to Merck & Co., Inc. Antipsychotic 3-trifluoromethylsulfinyl analogs of cyproheptadine. 4,132,796, Cl. 424-267.000.

Republic Steel Corporation: *See—*
Watson, Robert G., 4,133,036, Cl. 364-477.000.

Rescalli, Carlo; and Pacifico, Antonio, to Snamprogetti S.p.A. Method for the preparation of carbonyl products starting from hydrocarbon streams coming from steam-cracking installations. 4,132,739, Cl. 260-605.00S.

Resistance Welder Corporation: *See—*
Blair, Robert H., 4,132,880, Cl. 219-114.000.

Resler, Edwin L., Jr., to Cornell Research Foundation Inc. Method and means for reducing pollutants from the exhaust of hydrocarbon fuel combustion means. 4,132,209, Cl. 123-169.00R.

Restaurant Technology, Inc.: *See—*
Jewell, Donald K., 4,132,344, Cl. 229-2.50R.

Revesz, Clara: *See—*
Gauthier, Jean A.; Humber, Leslie G.; and Revesz, Clara, 4,132,710, Cl. 546-63.000.

Rexnord Inc.: *See—*
Andersen, John W., 4,132,536, Cl. 55-97.000.

Reynolds Metals Company: *See—*
Scott, Irvin C.; Settle, Evan E., III; and Hickerson, Robert J., 4,131,981, Cl. 29-505.000.

Rhone-Poulenc Industries: *See—*
Crochemore, Michel M.; and Gay, Michel M., 4,132,703, Cl. 260-45.80A.
Meiller, Francois; and Mirabel, Bernard, 4,132,596, Cl. 195-63.000.

Ri-El Ricerche Elettroniche S.p.A.: *See—*
Righi, Nardino, 4,133,014, Cl. 360-96.000.

Richards, Elmer A., to Eaton Corporation. Shiftable change speed transmission utilizing improved blocker and jaw clutch assembly. 4,132,122, Cl. 74-339.000.

Richards Manufacturing Company, Inc.: *See—*
Treace, James T., 4,131,956, Cl. 3-1.910.

Richardson-Merrell Inc.: *See—*
Volenec, Frank J.; and Todd, Judson D., 4,132,775, Cl. 424-89.000.

Richter, Peter: *See—*
Koplin, Eckhard; Hoffmann, Horst; Raiff, Siegfried; Richter, Peter; and Kaufmann, Helmut, 4,132,235, Cl. 134-99.000.

Ricoh Company, Ltd.: *See—*
Watabe, Rokuro; Ohira, Makoto; and Sakai, Katsuo, 4,132,477, Cl. 355-11.000.

Riechmann, Werner, to Blaupunkt-Werke GmbH. Television vertical deflection circuit. 4,132,929, Cl. 315-408.000.

Rieger, Franz: *See—*
Linder, Ernst; Steinke, Leo; and Rieger, Franz, 4,132,615, Cl. 204-195.00S.

Riegler, Ernst; and Schmidt, Manfred, to Vereinigte Osterreichische Eisen-und Stahlwerke - Alpine Montan Aktiengesellschaft. Slide-articulation bearing, in particular for tiltable converters. 4,132,452, Cl. 308-3.00R.

Righi, Nardino, to Ri-El Ricerche Elettroniche S.p.A. Apparatus for reproducing and/or recording magnetic tape in cassettes. 4,133,014, Cl. 360-96.000.

Rikagaku Kenkyusho: *See—*
Hashimoto, Tohru; Kawarada, Akira; and Tamura, Sachiko, 4,132,541, Cl. 71-76.000.

Riken Keiki Kabushiki Kaisha: *See—*
Yamaguchi, Shigeto, 4,132,673, Cl. 252-466.0PT.

Ring, Michael: *See—*
Brandon, Ralph E.; Ring, Michael; and Morris, James B., 4,132,592, Cl. 162-216.000.

Riniker, James P., to Northern Engraving Company, Inc. Method of making flexible pressure sensitive switch. 4,131,991, Cl. 29-622.000.

Rips, Irving, to Realite Optical Company. Apparatus for manufacturing plastic lenses. 4,132,518, Cl. 425-143.000.

Ritter, Ernst: *See—*
Straubel, Max; Ritter, Ernst; Maier, Sieghart; and Lehmann, Werner, 4,132,206, Cl. 123-140.00R.

Rivers, Jacob B., Jr.; and Budke, Harry T., Jr., to Western Chemical Company. Process for injecting liquid in moving natural gas streams. 4,132,535, Cl. 55-23.000.

Rivlin, Grigory I.: *See—*
Andoniev, Sergei M.; Gritsuk, Lev D.; Gorbik, Anatoly S.; Kurganov, Viktor V.; Oleinik, Nikolai P.; Rivlin, Grigory I.; Stetsenko, Nikolai V.; Shamil, Jury P.; Smetanin, Jury G.; and Nesterenko, Petr S., 4,132,852, Cl. 13-32.000.

Roach, Alfred J.; and Roberts, Charles, to TII Corporation. Air gap back-up surge arrester. 4,133,019, Cl. 361-124.000.

Roach, Thomas A., to Service First, Inc. Method of making squirrel cage rotor. 4,131,990, Cl. 29-598.000.

Roark, Charles F. Solar energy collector. 4,132,222, Cl. 126-271.000.

Robert Bosch GmbH: *See—*
Bianchi, Valerio; Metcher, Siegfried; Latsch, Reinhard; Weidner, Hans; and Brettschneider, Johannes, 4,132,195, Cl. 123-32.0EA.
Linder, Ernst; Steinke, Leo; and Rieger, Franz, 4,132,615, Cl. 204-195.00S.
Schaal, Gerhard, 4,132,813, Cl. 427-90.000.
Straubel, Max; Ritter, Ernst; Maier, Sieghart; and Lehmann, Werner, 4,132,206, Cl. 123-140.00R.
Wilfert, Thomas; Grassle, Alfred; and Peters, Klaus-Jurgen, 4,132,211, Cl. 123-179.00L.
Wocher, Berthold; Pfendler, Thomas; and Pfitzemaier, Heinz, 4,132,991, Cl. 343-13.00R.
Zabler, Erich, 4,132,980, Cl. 340-195.000.

Roberts, Charles: *See—*
Roach, Alfred J.; and Roberts, Charles, 4,133,019, Cl. 361-124.000.

Roberts, Edward S. Smelting of iron ore with partially dried lignite. 4,132,546, Cl. 75-42.000.

Roberts, Richard W., to Borg-Warner Corporation. Rotary sliding vane compressor with magnetic vane retractor. 4,132,512, Cl. 418-23.000.

Robertshaw, Michael F. Roof ventilator. 4,132,160, Cl. 98-42.00R.

Robson, Ernest G.; and Smith, George A. M., to National Research Development Corporation. Blade for earth moving equipment. 4,132,017, Cl. 37-141.00R.

Rockwell International Corporation: *See—*
Green, James A., 4,132,228, Cl. 128-33.000.
Jovick, Raymond J., 4,132,293, Cl. 188-181.00R.
Tench, Dennis M.; and Ogden, Cameron A., 4,132,605, Cl. 204-1.00T.
White, Raymond V., 4,132,981, Cl. 340-203.000.

Rode, Oyars A.; Lusis, Andrei R.; Klyavin, Yanis K.; and Zamozdik, Talivaldis V., to Gosudarstvenny Universitet Imeni Petra Stuchki. Electrochrome element control device. 4,132,465, Cl. 350-357.000.

Rodgers, Billy R.: *See—*
Katz, Sidney; and Rodgers, Billy R., 4,132,639, Cl. 210-51.000.

Roehrick, Otto A. Behind the scene lights. 4,133,024, Cl. 362-101.000.

Rogers, Peter F.: *See—*
Engelberger, Joseph F.; Dunne, Maurice J.; and Rogers, Peter F., 4,132,937, Cl. 318-568.000.

Roggenkamp, George H., to Eaton Corporation. Actuating mechanism. 4,132,128, Cl. 74-527.000.

Rohr, Alfred: *See—*
Dessauer, Guido; Leisner, Egon; and Rohr, Alfred, 4,132,826, Cl. 428-314.000.

Rohr Industries, Inc.: *See—*
Reed, Clyde H., 4,132,519, Cl. 425-174.200.

Rohrer, Douglas D.; and Blowers, Albert K., to Eaton Corporation. Fluid coupling device with improved disengaged operating characteristics. 4,132,299, Cl. 192-58.00B.

Roli, Lino, to Italtractor I.T.M. S.p.A. Seal with a compensating thrust ring. 4,132,418, Cl. 277-91.000.

Rollyson Aluminum Products, Inc.: *See—*
Rollyson, James H., 4,132,044, Cl. 52-775.000.

Rollyson, James H., to Rollyson Aluminum Products, Inc. High-strength window assembly. 4,132,044, Cl. 52-775.000.

Rom, Frank E.; and Wenzler, Carl J., to Solar Energy Products Company. Solar air heat collector. 4,132,217, Cl. 126-270.000.

Roman, Steven A., to Shell Oil Company. Enol lactone intermediate for the preparation of (1R,cis)-caronaldehydic acid. 4,132,717, Cl. 260-343.210.

Romanov, Evgeny I.: *See—*
Arendt, Georgy A.; Pokrovsky, Vladimir V.; Burov, Boris A.; Lipovich, Alexandr L.; Romanov, Evgeny I.; Vainshtein, Galina L.; and Khaitovich, Tsalel S., 4,132,317, Cl. 212-49.000.

Rorden, Robert J.: *See—*
Smith, William E.; and Rorden, Robert J., 4,132,900, Cl. 250-491.000.

Rosati, Luciano: *See—*
Camprincoli, Pierpaolo; and Rosati, Luciano, 4,132,556, Cl. 106-90.000.

Rose, William H.; and Granitz, Richard F., to AMP Incorporated. Matrix pin assembly tool. 4,131,982, Cl. 29-566.200.

Rosenberg, Robert: *See—*
Cuomo, Jerome J.; DiStefano, Thomas H.; and Rosenberg, Robert, 4,132,571, Cl. 148-1.500.

Rosenthal, Arnold J.: *See—*
Stackman, Robert W.; Rosenthal, Arnold J.; and Sakowitz, Marvin L., 4,132,705, Cl. 526-60.000.

Rossbach, Horst, to AGFA-Gevaert AG. Sound recording apparatus. 4,133,010, Cl. 360-68.000.

Roth, Martin, to Ciba-Geigy Corporation. Process for the production of maleimides. 4,132,715, Cl. 260-326.260.

Rotter, Gerhard: *See—*
Kittler, Wolfram; and Rotter, Gerhard, 4,133,009, Cl. 360-9.000.

Roy, Michael L.: *See—*
Cise, Michael D.; and Roy, Michael L., 4,132,848, Cl. 544-28.000.
Royal Industries, Inc.: *See—*
Shapiro, Haskell, 4,132,983, Cl. 340-331.000.
Royce Chemical Company: *See—*
Fono, Andrew; and Patton, Ray F., 4,132,522, Cl. 8-17.000.
Ruckdeschel, Hermann; and Rambold, Thomas, to Siemens Aktiengesellschaft. Data processing system with two or more subsystems having combinational logic units for forming data paths between portions of the subsystems. 4,133,029, Cl. 364-200.000.
Rudolf, Karl: *See—*
Meistring, Rolf; Rúdolf, Karl; Schmid, Werner; and Zeyher, Fritz, 4,132,148, Cl. 89-1.701.
Rudszinat, Willy: *See—*
Erdmann, Otto; Deutsch, Reinhard; Symmanek, Horst; and Rudszinat, Willy, 4,132,398, Cl. 271-9.000.
Rumpf, Hans; and Leschonski, Kurt, to Rumpf, Hans. Method of an apparatus for sifting particulate material in a cross-current. 4,132,634, Cl. 209-136.000.
Rupp, Gunter, to Siemens Aktiengesellschaft. Method and apparatus for the continuous, contactless testing of an elongated conductor which consists at least partially of superconductive material. 4,132,949, Cl. 324-224.000.
Russer, Peter, to Licentia Patent-Verwaltungs-G.m.b.H. Circuit arrangement for amplifying high frequency electromagnetic waves. 4,132,956, Cl. 330-5.000.
Ruti Machinery Works Ltd.: *See—*
Steiner, Alois, 4,132,248, Cl. 139-436.000.
Ruti-Te Strake B.V.: *See—*
van Mullekom, Hubert P., 4,132,370, Cl. 242-47.120.
Rutledge, Thomas F., to ICI Americas Inc. Oxidative coupling of alkylphenols catalyzed by metal complexes of diimino acid. 4,132,722, Cl. 260-396.00N.
Ryd, Per-Olof, to Atlas Copco Aktiebolag. Fluid mixing device. 4,132,361, Cl. 239-417.500.
Ryobi Ltd.: *See—*
Ishii, Koji, 4,132,167, Cl. 101-425.000.
S & H Moonlight Design Industries, Inc.: *See—*
Stefaniak, James L., 4,131,992, Cl. 29-622.000.
S I Handling Systems, Inc.: *See—*
Ziegenfus, Barry L.; and Scheel, Russell H., 4,132,174, Cl. 104-48.000.
Saarloos, Pieter, to Breedveld Interieurwerken B.V. Panel assembly hinge. 4,131,971, Cl. 16-150.000.
Sabat, Jack M. Weapon. 4,132,408, Cl. 273-84.00R.
Saeki, Keiso: *See—*
Ishige, Sadao; Usui, Hideo; and Saeki, Keiso, 4,132,436, Cl. 282-27.500.
Saipem S.p.A.: *See—*
Bove, Ottavio; and Cannata, Ugo, 4,132,338, Cl. 228-27.000.
Saito, Akio, to Showa Seitai Kogyo Kaisha Ltd. Moisture proof bags provided with blow-in ports and method of manufacturing the same. 4,132,347, Cl. 229-62.500.
Saito, Ichiro; and Saito, Kazuo, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Vinyl chloride series resin blend compositions. 4,132,749, Cl. 260-876.00R.
Saito, Junichi: *See—*
Aya, Masahiro; Saito, Junichi; Kume, Toyohiko; and Yasui, Kazuomi, 4,132,542, Cl. 71-86.000.
Saito, Kazuo: *See—*
Saito, Ichiro; and Saito, Kazuo, 4,132,749, Cl. 260-876.00R.
Saito, Masaaki, to Nissan Motor Company, Limited. Valve arrangement for use in mixture ratio control system of internal combustion engine. 4,132,194, Cl. 123-32.0EA.
Saito, Nobuo: *See—*
Hiroshima, Minoru; Yoshizawa, Shigeru; Saito, Nobuo; Asano, Atsushi; Suehiro, Hiroshi; Saitoh, Minoru; and Mise, Keisuke, 4,133,043, Cl. 365-15.000.
Saito, Shinroku; Sawaoka, Akira; and Araki, Masatada, to Nippon Oil and Fats Co. Ltd. Method for producing a sintered compact of boron nitride with high density form. 4,132,554, Cl. 106-55.000.
Saitoh, Kozo; and Izumi, Sumio, to Mitsui Mining & Smelting Co., Ltd. Method for separating mixture of plastics. 4,132,633, Cl. 209-9.000.
Saitoh, Minoru: *See—*
Hiroshima, Minoru; Yoshizawa, Shigeru; Saito, Nobuo; Asano, Atsushi; Suehiro, Hiroshi; Saitoh, Minoru; and Mise, Keisuke, 4,133,043, Cl. 365-15.000.
Sakaguchi, Keiichi; and Someya, Atsushi, to Canon Kabushiki Kaisha. Zoom optical system. 4,132,463, Cl. 350-184.000.
Sakai, Katsuo: *See—*
Watabe, Rokuro; Ohira, Makoto; and Sakai, Katsuo, 4,132,477, Cl. 355-11.000.
Sakai, Masao: *See—*
Hatayama, Shunichi; and Sakai, Masao, 4,132,921, Cl. 315-39.510.
Sakai, Tsuyoshi: *See—*
Sano, Sinitiro; Kuroda, Noriaki; and Sakai, Tsuyoshi, 4,132,938, Cl. 318-568.000.
Sakowitz, Marvin L.: *See—*
Stackman, Robert W.; Rosenthal, Arnold J.; and Sakowitz, Marvin L., 4,132,705, Cl. 526-60.000.
Sakuma, Hiroshi, to NGK Insulators Ltd. Filter plate opening mechanism for filter presses. 4,132,647, Cl. 210-230.000.
Sakurai, Yoshiyuki, to Kabushiki Kaisha Suwa Seikosha. Reflective or transmissive optical reader. 4,132,351, Cl. 235-454.000.
Sala, Angelo: *See—*
Ferrentino, Antonio; Brovedan, Antonio; and Sala, Angelo, 4,132,756, Cl. 264-174.000.
Salaville, Andre: *See—*
Maille, Jacques H. P.; and Salaville, Andre, 4,132,999, Cl. 357-30.000.
Salberta, Richard A., to Taurus Corporation. Information reader timing circuit. 4,132,352, Cl. 235-456.000.
Salna, Karl: *See—*
Vidakovic, Aleksandar; and Salna, Karl, 4,132,258, Cl. 152-185.000.
Saloom, Joseph T., to Wheatland Tube Company. Drying tower for the inner diameter of elongated tubes. 4,132,012, Cl. 34-105.000.
Sampei Komiya: *See—*
Takahashi, Shigeo, 4,132,510, Cl. 417-534.000.
Samson Industries, Inc.: *See—*
Frambach, Henry R., 4,132,035, Cl. 49-484.000.
Samson, James A. R. Polarization analyzer for vacuum ultraviolet and x-ray radiation. 4,132,653, Cl. 250-272.000.
Sandell, Lionel S.: *See—*
Marquisee, Mark J.; and Sandell, Lionel S., 4,132,560, Cl. 106-288.00B.
Sandhu, M. Akram, to Eastman Kodak Company. Dye element with a transparent polyester layer containing heat-transferable dyes. 4,132,833, Cl. 428-481.000.
Sandoz, Inc.: *See—*
Barcza, Sandor, 4,132,725, Cl. 260-448.20N.
Sanford, Karl J.: *See—*
Eikenberry, Jon N.; Sanford, Karl J.; and Sutton, Richard C., 4,132,528, Cl. 23-230.00B.
Sankey, Ivor G.; and Turner, Colin F. S., to GKN Transmissions Ltd. Sealing members for universal joints. 4,132,422, Cl. 277-212.0FB.
Sano, Sinitiro; Kuroda, Noriaki; and Sakai, Tsuyoshi, to Tokico Limited. Playback type industrial robot. 4,132,938, Cl. 318-568.000.
Santroch, George; and Humber, Leslie G., to Ayerst, McKenna & Harrison, Ltd. [2]Benzopyrano[4,3-c]pyridine derivatives and process therefor. 4,132,709, Cl. 546-89.000.
Sapunov, Viktor E.: *See—*
Rabinovich, Volf I.; Kriger, Jury N.; Svitenko, Igor A.; and Sapunov, Viktor E., 4,132,545, Cl. 75-10.00C.
Sargisson, Donald F.: *See—*
Adamson, Arthur P.; Sargisson, Donald F.; and Stotler, Charles L., Jr., 4,132,069, Cl. 60-226.00R.
Sato, Minoru; Takahashi, Isao; Kurasawa, Takanao; Yoshioka, Yoshio; and Nakagawa, Yukio, to Hitachi, Ltd. Puffer type gas circuit breaker. 4,132,876, Cl. 200-148.00A.
Satoh, Kenji: *See—*
Tachikawa, Hajime; Satoh, Kenji; and Watanabe, Mitsuru, 4,132,878, Cl. 219-10.55B.
Savenko, Alevtina I.: *See—*
Nametkin, Nikolai S.; Matveev, Mikhail S.; Gubin, Sergei P.; Dekhterman, Abram S.; Tjurin, Vladimir D.; Skibenko, Anatoly P.; Orlova, Valentina S.; Savenko, Alevtina I.; and Podolskaya, Irina P., 4,132,631, Cl. 208-236.000.
Sawaoka, Akira: *See—*
Saito, Shinroku; Sawaoka, Akira; and Araki, Masatada, 4,132,554, Cl. 106-55.000.
Saylor, Arthur D. Technique for handling and transporting cement. 4,132,557, Cl. 106-100.000.
Scala, Norma, administratrix: *See—*
Burke, Oliver W., Jr., deceased; and Humphreys, Victor T., 4,132,561, Cl. 106-308.00M.
Burke, Oliver W., Jr., deceased; and Humphreys, Victor T., 4,132,562, Cl. 106-308.00M.
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Scarola, Leonard S.; and White, Charles E., to Union Carbide Corporation. Electrical cable. 4,132,857, Cl. 174-107.000.
Schaal, Gerhard, to Robert Bosch GmbH. Method for producing solderable metallized layer on a semiconducting or insulating substrate. 4,132,813, Cl. 427-90.000.
Schadlich, Gunther: *See—*
Moraw, Roland; and Schadlich, Gunther, 4,132,893, Cl. 250-315.00A.
Schaefer, Daniel W.: *See—*
Jones, Kenneth R.; and Schaefer, Daniel W., 4,132,280, Cl. 180-19.00H.
Schafer, Rolf, to Bayer Aktiengesellschaft. Method of purifying brine used in electrolysis by the amalgam process. 4,132,759, Cl. 423-161.000.
Schaffran Propeller Lehne & Co.: *See—*
Kreft, Robert; and Torper, Udo, 4,132,503, Cl. 416-167.000.
Schaible, Paul M.; Schwartz, Geraldine C.; and Zielinski, Laura B., to International Business Machines Corporation. Selective dry etching of substrates. 4,132,586, Cl. 156-643.000.
Schalk, Karl, to Siemens Aktiengesellschaft. Brushless D-C motor with several Y connected phase windings. 4,132,930, Cl. 318-138.000.
Scheel, Russell H.: *See—*
Ziegenfus, Barry L.; and Scheel, Russell H., 4,132,174, Cl. 104-48.000.
Scheffel, Carl W., to Fox Industries, Inc. Restraint assembly for bridge roadway expansion joints. 4,132,491, Cl. 404-68.000.
Schering Aktiengesellschaft: *See—*
Klieger, Erich; and Speck, Ulrich, 4,132,731, Cl. 424-5.000.

Schiess, Oskar; and Huber, Franz, to Sulzer Brothers Limited. Drive for a yarn feeder for a textile machine. 4,132,368, Cl. 242-47.010.
Schiffers, Theo, to H. Krantz GmbH & Co. Device for limiting the angle of adjustment of an articulatedly supported rail pair. 4,131,977, Cl. 26-91.000.
Schindler, Rudolf A.: *See*—
United States of America, National Aeronautics and Space Administration; and Schindler, Rudolf A., 4,132,940, Cl. 318-640.000.
Schlegel (UK) Limited: *See*—
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Schlinke, Gunter R. Hydrostatic converter. 4,132,072, Cl. 60-443.000.
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Schmidt, Andreas; and Schwarzenbach, Kurt, to Ciba-Geigy Corporation. Phenol esters and amides and polymers stabilized therewith. 4,132,702, Cl. 260-45.80N.
Schmidt, Dietrich; Hofer, Johann; and Huber, Karl E., to Wacker-Chemie GmbH. Process for the production of pure, silicon elemental semiconductor material. 4,132,763, Cl. 423-350.000.
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Fernholz, Hans; Schmidt, Hans-Joachim; and Wunder, Friedrich, 4,132,733, Cl. 562-601.000.
Schmidt, Joseph D., Jr. Display and clamp device. 4,132,316, Cl. 211-13.000.
Schmidt, Manfred: *See*—
Riegler, Ernst; and Schmidt, Manfred, 4,132,452, Cl. 308-3.00R.
Schmut, Wolfgang: *See*—
Behmel, Klaus; Schmut, Wolfgang; and Zuckert, Bertram, 4,132,687, Cl. 260-22.00A.
Schmutzer, Joel J.; and Elkerton, George D., to Forest Electric Company. Direct current ballasting and starting circuitry for gaseous discharge lamps. 4,132,925, Cl. 315-208.000.
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Lyons, James E.; Schneider, Abraham; and Myers, Harry K., Jr., 4,132,742, Cl. 260-668.00A.
Schneider, Richard T.: *See*—
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Schnurr, Myron J.; Schnurr, Alvin D.; and Schnurr, Marian, 4,132,214, Cl. 124-1.000.
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Schnurr, Myron J.; Schnurr, Alvin D.; and Schnurr, Marian, 4,132,214, Cl. 124-1.000.
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Verberne, Petrus; Zwitserloot, Wilhelmus R. M.; and Nauta, Robijn R., 4,132,566, Cl. 127-65.000.
Scholz, Manfred; Kaiser, Karl; and Semmler, Horst, to Hoechst Aktiengesellschaft. Process for drying chlorinated polymers. 4,132,006, Cl. 34-10.000.
Schorr, Murray A., to Westland Aircraft Limited. Store ejector release units. 4,132,377, Cl. 244-137.00R.
Schotte, Dietwald: *See*—
Gaus, Harry; Johnson, Jeffrey; Milutziki, Udo; and Schotte, Dietwald, 4,132,935, Cl. 318-480.000.
Schotten, Josef: *See*—
Lohmer, Wilfried; and Schotten, Josef, 4,132,533, Cl. 51-295.000.
Schow, Harvey B. Welding simulator spot designator system. 4,132,014, Cl. 35-13.000.
Schreiber, Ronald S.; and Principe, Joseph R. Warm two tone flavored dentifrice. 4,132,771, Cl. 424-52.000.
Schrewe, Hans; and Pleschiutschnigg, Fritz P., to Mannesmann Aktiengesellschaft. Apparatus for measuring curvature and other geometric relations of dual roller tracks. 4,132,003, Cl. 33-182.000.
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Husges, Gerd; and Grimm, Eberhard, 4,132,056, Cl. 57-263.000.
Schuler, Jacob P. Hand-operated tool for bending pipes. 4,132,100, Cl. 72-217.000.
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Benemann, Annelie; Schult, Norbert; Voj, Peter; and Hosemann, Bernhard, 4,132,115, Cl. 73-349.000.
Schulte, Klaus: *See*—
Kreuer, Karl D.; and Schulte, Klaus, 4,132,838, Cl. 521-50.000.
Schuman, Mark. Thermocompressor utilizing a free piston coasting between rebound chambers. 4,132,505, Cl. 417-207.000.
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Schwarz, Richard C.; and Chestang, Bobby G., to Betz Laboratories, Inc. Process for protecting asbestos-cement bearing surfaces in recirculating cooling water systems. 4,132,526, Cl. 422-1.000.
Schwarzenbach, Kurt: *See*—
Schmidt, Andreas; and Schwarzenbach, Kurt, 4,132,702, Cl. 260-45.80N.
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Bildstein, Hubert; Petter, Hubert; and Simader, Fritz, 4,132,917, Cl. 313-330.000.
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Schwimmer, Michael F., to UOP Inc. Temperature control in exothermic/endothermic reaction systems. 4,132,530, Cl. 23-230.00A.
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Regnier, Gilbert; Canevari, Roger; and Desnoyers, Pierre, 4,132,787, Cl. 424-230.000.
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Klein, Yitzchak; and Goldstein, Jonathan R., 4,132,619, Cl. 204-242.000.
Scifres, Donald R.: *See*—
Streifer, William; Scifres, Donald R.; and Burnham, Robert D., 4,132,960, Cl. 331-94.50H.
Scott Chatham Company: *See*—
Hiers, John J.; and Wald, Stephen A., 4,132,821, Cl. 428-151.000.
Scott, Irvin C.; Settle, Evan E., III; and Hickerson, Robert J., to Reynolds Metals Company. Method of securing a knob to a ball bat handle. 4,131,981, Cl. 29-505.000.
Scott Paper Company: *See*—
Peterson, John O. H., 4,132,168, Cl. 101-471.000.
Seaton, John J.; and Slagle, James K., to United States Steel Corporation. Graphite lubricant application apparatus and method. 4,132,096, Cl. 72-21.000.
SEB S.A.: *See*—
Tanguy, Pierre, 4,133,016, Cl. 361-23.000.
Seeley, Robert L.; and Flanigan, William F., to United States of America, Navy. Biopotential movement artifact inhibiting system. 4,132,226, Cl. 128-2.10R.
Segar, William R.: *See*—
Miller, Howard N.; and Segar, William R., 4,132,175, Cl. 104-130.000.
Seibert, Gerhard. Compensating storage for cable or the like. 4,132,369, Cl. 242-47.500.
Seita, Toru; Takahashi, Kenji; Asami, Shunichi; and Shimizu, Akihiko, to Toyo Soda Manufacturing Co., Ltd. Process for preparing cation-exchange membrane. 4,132,682, Cl. 521-27.000.
Sell, Victor L., to Ampex Corporation. Early noise pulse and long duration, stabilized switching pulse. 4,133,050, Cl. 365-213.000.
Semmler, Horst: *See*—
Scholz, Manfred; Kaiser, Karl; and Semmler, Horst, 4,132,006, Cl. 34-10.000.
Service First, Inc.: *See*—
Roach, Thomas A., 4,131,990, Cl. 29-598.000.
Settle, Evan E., III: *See*—
Scott, Irvin C.; Settle, Evan E., III; and Hickerson, Robert J., 4,131,981, Cl. 29-505.000.
Sewage Osmosis Inc.: *See*—
Peterson, Earl C.; and Coolbroth, Frank P., 4,132,625, Cl. 204-299.00R.
Shaffer, Gary W.; and Purzycki, Kenneth L., to Givaudan Corporation. Perfume compositions containing 2-(2-cyanoethylidene)-2-methylbicyclo(2.2.1)hept-5-enes. 4,132,677, Cl. 252-522.000.
Shaffer, Walter M., to Caterpillar Tractor Co. Power train with an auxiliary creeper drive system. 4,132,132, Cl. 74-732.000.
Shaftner, Robert F.: *See*—
Briggs, Eugene C.; Shaftner, Robert F.; and Giambrone, Harry J., 4,132,353, Cl. 236-10.000.
Shah, Chandra C.; and Laurelli, James A., to Westinghouse Electric Corp. Temperature probe assembly for gas turbine engine. 4,132,114, Cl. 73-343.00R.
Shamil, Jury P.: *See*—
Andoniev, Sergei M.; Gritsuk, Lev D.; Gorbik, Anatoly S.; Kurganov, Viktor V.; Oleinik, Nikolai P.; Rivlin, Grigory I.; Stetsenko, Nikolai V.; Shamil, Jury P.; Smetanin, Jury G.; and Nesterenko, Petr S., 4,132,852, Cl. 13-32.000.
Shanebrook, Robert E., to Cutler-Hammer, Inc. Yarn detector switch with snap-on trapper. 4,132,875, Cl. 200-61.130.
Shanklin, Donald J.: *See*—
Aro, Ernesto M.; and Shanklin, Donald J., 4,132,091, Cl. 70-165.000.
Shannon, Carmen H., executrix: *See*—
Harrison, Robert J., deceased, 4,132,268, Cl. 166-244.00C.
Shapiro, Haskell, to Royal Industries, Inc. Radio synchronized warning light system. 4,132,983, Cl. 340-331.000.
Sharp Kabushiki Kaisha: *See*—
Nagano, Humikazu, 4,132,977, Cl. 340-146.3AG.
Shigemasa, Junichiro; Ohno, Takashi; and Tachikawa, Sadao, 4,132,899, Cl. 250-577.000.
Sharples, Wilbert, to Lockheed Corporation. Aircraft landing gear torque scissors with universal joint and quick disconnect. 4,132,376, Cl. 244-104.00R.
Shatto, Walter C., Jr., to AMP Incorporated. Method and apparatus for deploying wires. 4,132,252, Cl. 140-147.000.
Shatto, Walter C., Jr.: *See*—
Folk, Kenneth F.; and Shatto, Walter C., Jr., 4,132,251, Cl. 140-147.000.
Shaylor, Harold H., to Westvaco Corporation. Hosiery package. 4,132,309, Cl. 206-278.000.
Shell Oil Company: *See*—
Kim, Leo, 4,132,762, Cl. 423-272.000.
Roman, Steven A., 4,132,717, Cl. 260-343.210.
Verbrugge, Pieter A.; and Kramer, Petrus A., 4,132,728, Cl. 260-465.00G.
Verschuur, Eke, 4,132,365, Cl. 241-21.000.
Shepard, Kenneth L.; and Paleveda, William J., Jr., to Merck & Co., Inc. N-(Benzoxazolinyl-2-one)-tricyclic dicarboximides. 4,132,799, Cl. 424-272.000.

Shigemasa, Junichiro; Ohno, Takashi; and Tachikawa, Sadao, to Sharp Kabushiki Kaisha. Liquid-level detector. 4,132,899, Cl. 250-577.000.
Shikutani, Michio: *See*—
Akiyama, Satoshi; and Shikutani, Michio, 4,132,507, Cl. 417-234.000.
Shima, Seiya: *See*—
Terunuma, Mutsuhiro; Shima, Seiya; Tashiro, Korefumi; Ando, Takeki; Inaba, Hiromi; Kurosawa, Toshiaki; and Kuroha, Hiroaki, 4,133,018, Cl. 361-87.000.
Shimano Industrial Company Limited: *See*—
Nagano, Masashi; and Fujimoto, Hideaki, 4,132,119, Cl. 74-217.00B.
Shimizu, Akihiko: *See*—
Seita, Toru; Takahashi, Kenji; Asami, Shunichi; and Shimizu, Akihiko, 4,132,682, Cl. 521-27.000.
Shimizu, Kazuaki, to Nissan Motor Company, Limited. Anti skid control valve. 4,132,451, Cl. 303-116.000.
Shimoda, Masao: *See*—
Uchikawa, Hiroshi; and Shimoda, Masao, 4,132,558, Cl. 106-104.000.
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Chikatsu, Tatsusuke; Shimokawa, Shinichi; Miura, Takao; and Okumura, Taro, 4,132,666, Cl. 252-309.000.
Shinomiya, Tsutomu, to Kabushiki Kaisha Tomoku. Scorer apparatus. 4,132,157, Cl. 93-58.100.
Shinto Paint Co., Ltd.: *See*—
Toyoshima, Kazuaki; Koyanagi, Michitoshi; and Suzuki, Tameyuki, 4,132,686, Cl. 260-21.000.
Shionogi & Co., Ltd.: *See*—
Maekawa, Hideyuki; and Ishitobi, Kaoru, 4,132,527, Cl. 23-230.00B.
Shirahata, Kunikatsu: *See*—
Tomioka, Shinji; Mori, Yasuki; and Shirahata, Kunikatsu, 4,132,846, Cl. 536-17.000.
Shirato, Hajime, to Nippon Electric Co., Ltd. Memory circuit arrangement utilizing one-transistor-per-bit memory cells. 4,133,049, Cl. 365-208.000.
Shockovsky, Robert E. Dial setting device. 4,132,002, Cl. 33-180.00R.
Shockovsky, Robert E. Portable planing machine. 4,132,254, Cl. 144-134.00D.
Shorewood Packaging Corp.: *See*—
Glinert, Floyd, 4,132,311, Cl. 206-387.000.
Shoults, Royland D., to United States of America, Army. Preparation of carboranyl sulfides. 4,132,740, Cl. 260-606.50B.
Showa Denko K.K.: *See*—
Ueshima, Takashi; Yokoyama, Toshiro; and Kobayashi, Shoichi, 4,132,750, Cl. 260-887.000.
Showa Seitai Kogyo Kaisha Ltd.: *See*—
Saito, Akio, 4,132,347, Cl. 229-62.500.
Shrock, Christian G.: *See*—
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Sidhu, Pawitter S., to Micro Peripherals, Inc. Noise suppression circuit adapted for use with bifilar windings. 4,132,954, Cl. 328-165.000.
Siegal, Richard G. Operator readable and machine readable character recognition systems. 4,132,976, Cl. 340-146.30Z.
Siemens Aktiengesellschaft: *See*—
Kusserow, Bernd, 4,133,046, Cl. 365-45.000.
Littwin, Burkhard, 4,133,045, Cl. 365-39.000.
Ruckdeschel, Hermann; and Rambold, Thomas, 4,133,029, Cl. 364-200.000.
Rupp, Gunter, 4,132,949, Cl. 324-224.000.
Schalk, Karl, 4,132,930, Cl. 318-138.000.
Siglow, Joachim, 4,132,867, Cl. 179-15.0BS.
Sieracki, Piotr: *See*—
Kubik, Zbigniew; Sieracki, Piotr; and Skotarczyk, Edmund. 4,132,185, Cl. 113-120.00R.
Siglow, Joachim, to Siemens Aktiengesellschaft. Process for the frame synchronization of a time division multiplex system. 4,132,867, Cl. 179-15.0BS.
Siltec Corporation: *See*—
Bonora, Anthony C., 4,132,037, Cl. 51-131.00C.
Silvestrini, to Aziende Chimiche Riunite Angelini Francesco A.S.-R.A.F. S.p.A. Use of etoperidone in parkinsonism and in other extrapyramidal syndromes characterized by tremors. 4,132,791, Cl. 424-250.000.
Simader, Fritz: *See*—
Bildstein, Hubert; Petter, Hubert; and Simader, Fritz, 4,132,917, Cl. 313-330.000.
Simmonds Precision Products, Inc.: *See*—
Bentz, Allan J., 4,132,944, Cl. 324-30.00R.
Simmons, John P.: *See*—
Brown, Richard T.; Halberg, Robert W.; Simmons, John P.; and Holdeman, John W., 4,132,297, Cl. 192-36.000.
Simmons, Lovel R. Combination tank transporter and general cargo trailer. 4,132,323, Cl. 214-85.000.
Simpson, Paul R. Telephone book hanger. 4,132,501, Cl. 281-15.00A.
Singer Company, The: *See*—
Friedland, Bernard, 4,132,482, Cl. 356-350.000.
Johnson, Ralph E.; and Urciola, John A., 4,132,454, Cl. 312-27.000.
Zocher, Josef, 4,131,978, Cl. 28-115.000.
Singh, Nirmal: *See*—
Anderson, Harry C.; MacKenzie, Burton T., Jr.; Prober, Maurice; and Singh, Nirmal, 4,132,858, Cl. 174-120.0SR.
Singleton, Thomas C., to Monsanto Company. Synthesis of carboxylic acids. 4,132,734, Cl. 562-522.000.
Sinn, Robert S., to Esrac Computer Corporation. Electronic speed rating calculator and method. 4,133,031, Cl. 364-412.000.
Skibenko, Anatoly P.: *See*—
Nametkin, Nikolai S.; Matveev, Mikhail S.; Gubin, Sergei P.; Dekhterman, Abram S.; Tjurin, Vladimir D.; Skibenko, Anatoly P.; Orlova, Valentina S.; Savenko, Alevtina I.; and Podolskaya, Irina P., 4,132,631, Cl. 208-236.000.
Skinner, Alexander; and Cook, Ronald G. T., to Plessey Handel und Investments AG. Transmission of movement to a unit mounted on a rotatable carrier. 4,132,089, Cl. 64-2.00R.
Skinner, Francis B. J.: *See*—
Best, John S.; Hoyles, Ronald; Ingram, Geoffrey S.; and Skinner, Francis B. J., 4,132,773, Cl. 424-57.000.
Skotarczyk, Edmund: *See*—
Kubik, Zbigniew; Sieracki, Piotr; and Skotarczyk, Edmund, 4,132,185, Cl. 113-120.00R.
Slaats, Mathew A.; Overton, David E.; and Blessinger, James E., to Kimball International, Inc. Molding machine with proportional dispensing. 4,132,483, Cl. 366-162.000.
Slagle, James K.: *See*—
Seaton, John J.; and Slagle, James K., 4,132,096, Cl. 72-21.000.
Sloan, Donald A.: *See*—
King, J. Frank; and Sloan, Donald A., 4,131,979, Cl. 29-2.190.
Sloan Valve Company: *See*—
Billeter, Henry R., 4,132,388, Cl. 251-175.000.
Smetanin, Jury G.: *See*—
Andoniev, Sergei M.; Gritsuk, Lev D.; Gorbik, Anatoly S.; Kurganov, Viktor V.; Oleinik, Nikolai P.; Rivlin, Grigory I.; Stetsenko, Nikolai V.; Shamil, Jury P.; Smetanin, Jury G.; and Nesterenko, Petr S., 4,132,852, Cl. 13-32.000.
Smink, Dirk A.: *See*—
van Os, Jan L.; Oldenkamp, Engbert P.; and Smink, Dirk A., 4,132,777, Cl. 424-119.000.
Smirnov, Viktor S.: *See*—
Gryaznov, Vladimir M.; Smirnov, Viktor S.; Vdovin, Valentin M.; Ermilova, Margarita M.; Gogua, Lia D.; Pritula, Nina A.; and Litvinov, Igor A., 4,132,668, Cl. 252-430.000.
Smith, Andrew I.; and Wu, Wen-li, to Monsanto Company. Twist efficiency of oxadiazole/hydrazide yarn. 4,132,757, Cl. 264-210.00F.
Smith, Donald D.; Davis, Otis L., III; and Heiniger, Richard, to Ace Service Incorporated. Fertilizer applying knife assembly. 4,132,181, Cl. 111-7.000.
Smith, Douglas C., to Bell Telephone Laboratories, Incorporated. Automatic gain and return loss compensating line circuit. 4,132,863, Cl. 179-16.00F.
Smith, George A. M.: *See*—
Robson, Ernest G.; and Smith, George A. M., 4,132,017, Cl. 37-141.00R.
Smith, John S.: *See*—
Booth, Graham R.; Smith, John S.; and Clayton, Malcolm, 4,132,580, Cl. 156-193.000.
Smith, Philip A., to B. F. Goodrich Company, The. Thrust plate for caliper-type disc brakes. 4,132,291, Cl. 188-73.600.
Smith, Stanley N.: *See*—
Corsi, George L.; and Smith, Stanley N., 4,132,421, Cl. 277-166.000.
Smith, Timothy: *See*—
DeRouen, Rodney P.; and Smith, Timothy, 4,132,385, Cl. 251-147.000.
Smith, William E.; and Rorden, Robert J., to EMI Limited. Optical pointer for radiographic apparatus. 4,132,900, Cl. 250-491.000.
Smiths Industries, Inc.: *See*—
Hughes, Bill B., 4,132,908, Cl. 307-353.000.
Snamprogetti S.p.A.: *See*—
Rescalli, Carlo; and Pacifico, Antonio, 4,132,739, Cl. 260-605.00S.
Societa Farmaceutici Italia S.p.A.: *See*—
Bernardi, Luigi; Giardino, Pietro; Patelli, Bianca; and Arcamone, Federico, 4,132,721, Cl. 260-365.000.
Societa' Italiana Resine S.I.R. S.p.A.: *See*—
Vargiu, Silvio; Pitzalis, Mario; Crespolini, Giancarlo; and Giuliani, Gino, 4,132,718, Cl. 260-348.150.
Societa Italiana Vetro SIV S.p.A.: *See*—
Ciarniello, Giorgio; and De Lena, Oscar, 4,132,881, Cl. 219-203.000.
Societe Anonyme de Telecommunications: *See*—
Maille, Jacques H. P.; and Salaville, Andre, 4,132,999, Cl. 357-30.000.
Societe Anonyme dite: Le Joint Francais: *See*—
Lechanu, Jacques; and Gilbaut, Fernand, 4,132,399, Cl. 277-47.000.
Societe Anonyme Francaise du Ferodo: *See*—
Fenart, Jean-Claude, 4,132,120, Cl. 74-230.17A.
Le Brise, Raymond, 4,132,103, Cl. 72-326.000.
Soffer, Abraham, to University Patents, Inc. Electrochemical cells with non-aqueous electrolytes containing macroheterocyclic compounds. 4,132,837, Cl. 429-194.000.
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Ishii, Hakumi; Sogo, Yoshitaka; and Ida, Shuichiro, 4,132,123, Cl. 74-473.0SW.
Solar Energy Products Company: *See*—
Rom, Frank E.; and Wenzler, Carl J., 4,132,217, Cl. 126-270.000.
Solomonenko, Vladimir I.: *See*—
Gafarov, Palmir M.; Minkov, Jury V.; and Solomonenko, Vladimir I., 4,133,048, Cl. 365-208.000.

Somerville, William M.; and Watson, Edward D., to Clarke Chapman Limited. Winding mechanism. 4,132,387, Cl. 254-173.00R.

Someya, Atsushi: *See—*
Sakaguchi, Keiichi; and Someya, Atsushi, 4,132,463, Cl. 350-184.000.

Sony Corporation: *See—*
Hongu, Masayuki; Niimura, Tsutomu; and Kawakami, Hiromi, 4,132,952, Cl. 325-459.000.

Sousek, Eugene A.; Stroemer, John R.; and Whitsitt, Steven L., to Koehring Company. Syncro-matic circuit used with material spreaders. 4,132,941, Cl. 318-663.000.

South Shore Machine Company, Inc.: *See—*
Hodgson, William S., 4,132,583, Cl. 156-351.000.

Southwestern Industries, Inc.: *See—*
Culver, Irven H.; and Szymber, Oleg, 4,132,098, Cl. 72-102.000.

Soyez, Werner: *See—*
Deininger, Gunter; and Soyez, Werner, 4,132,671, Cl. 252-445.000.

Sparks, Keith L. Automotive electric generator. 4,132,282, Cl. 180-65.0DD.

Spaziante, Placido M.: *See—*
Giuffre, Luigi; Spaziante, Placido M.; Pozzi, Vittorio; and Modica, Giovanni, 4,132,819, Cl. 427-341.000.
Nidola, Antonio; and Spaziante, Placido M., 4,132,620, Cl. 204-242.000.

Spears, Colin P. Tumor growth measurement device. 4,131,998, Cl. 33-1.00C.

Speck, Ulrich: *See—*
Klieger, Erich; and Speck, Ulrich, 4,132,731, Cl. 424-5.000.

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Barcz, James P.; Bigelow, James H.; Jaeschke, James R.; Piber, Earl T.; and Spellman, Gordon B., 4,132,933, Cl. 318-346.000.

Sperry Rand Corporation: *See—*
Pires, Antonio, 4,131,995, Cl. 30-200.000.

Spetsialnoe Konstruktorskoe Bjuro Gazstroimashina: *See—*
Arendt, Georgy A.; Pokrovsky, Vladimir V.; Burov, Boris A.; Lipovich, Alexandr L.; Romanov, Evgeny I.; Vainshtein, Galina L.; and Khaitovich, Tsalel S., 4,132,317, Cl. 212-49.000.

Speyer, Fred B., to TRW Inc. Filled, thermoplastic workholding composition including a dicarboxylic acid, an alkylene hydrocarbon polymer, and an aromatic hydrocarbon polymer. 4,132,685, Cl. 260-17.00R.

Speyer, Fred B., to TRW Inc. Thermoplastic workholding composition and method of holding a workpiece. 4,132,689, Cl. 260-23.00R.

SPS Technologies, Inc.: *See—*
Cadwallader, James W., 4,132,815, Cl. 427-194.000.
Contaldo, Attilio, 4,132,147, Cl. 89-1.50G.

Spurling, Alan M., to Pye Limited. Crane load indicating arrangement. 4,133,032, Cl. 364-424.000.

Stackman, Robert W.; Rosenthal, Arnold J.; and Sakowitz, Marvin L., to Celanese Corporation. Process for preparing a halogenated aromatic polyester having a predetermined molecular weight by solution polymerization technique. 4,132,705, Cl. 526-60.000.

Stahl, Stanley E. Apparatus for applying non-liquid material to bore holes. 4,132,190, Cl. 118-76.000.

Stampleman, Henry. Article actuated coin dispensing closure for article collecting receptacles. 4,132,303, Cl. 194-4.00F.

Standard Oil Company (Indiana): *See—*
Swartz, Henry D., 4,132,581, Cl. 156-208.000.
Yu, Albert P.; and Myers, Edward C., 4,132,632, Cl. 208-216.000.

Standing, Charles N.; and Brandberg, Lawrence C., to Pillsbury Company, The. Food package for assuring uniform distribution of microwave energy and process for heating food. 4,132,811, Cl. 426-111.000.

Stanley Works, The: *See—*
Suska, Charles R., 4,131,969, Cl. 16-137.000.

State of Israel, Ministry of Industry, Commerce and Tourism, National Physical Laboratory of Israel: *See—*
Klein, Yitzchak; and Goldstein, Jonathan R., 4,132,619, Cl. 204-242.000.

Stauffer Chemical Company: *See—*
Arneklev, Duane R.; Baker, Don R.; and Walker, Francis H., 4,132,544, Cl. 71-118.000.
Broadhurst, Michael D., 4,132,713, Cl. 260-326.5FL.

Steckler, Steven A.: *See—*
Balaban, Alvin R.; and Steckler, Steven A., 4,132,927, Cl. 315-371.000.

Stedman, Cresswell E., Jr.: *See—*
Hochfelsen, Jerrold J., 4,132,295, Cl. 190-60.000.

Stefaniak, James L., to S & H Moonlight Design Industries, Inc. Method of re-conditioning mat switches. 4,131,992, Cl. 29-622.000.

Stein, Manfred, to VDO Adolf Schindling AG. Circuit arrangement for the control of a forward-rearward-counter. 4,132,905, Cl. 307-247.00A.

Steinbach, Robert L., to Chicago Lock Co. Protective cover for a handle lock. 4,132,092, Cl. 70-208.000.

Steiner, Alois, to Ruti Machinery Works Ltd. Winding device for filling-yarn bobbins. 4,132,248, Cl. 139-436.000.

Steinke, Leo: *See—*
Linder, Ernst; Steinke, Leo; and Rieger, Franz, 4,132,615, Cl. 204-195.00S.

Stephens, Ruth E., deceased; and by Stephens, William L., executor, to Ethyl Corporation. Process for preparing filled polyvinyl chloride compositions. 4,132,700, Cl. 260-42.140.

Stephens, William L., executor: *See—*
Stephens, Ruth E., deceased; and Stephens, William L., executor, 4,132,700, Cl. 260-42.140.

Stern, Robert: *See—*
Amigues, Pierre; Gaillard, Jean; Le Page, Jean-Francois; and Stern, Robert, 4,132,745, Cl. 260-683.200.

Stetsenko, Nikolai V.: *See—*
Andoniev, Sergei M.; Gritsuk, Lev D.; Gorbik, Anatoly S.; Kurganov, Viktor V.; Oleinik, Nikolai P.; Rivlin, Grigory I.; Stetsenko, Nikolai V.; Shamil, Jury P.; Smetanin, Jury G.; and Nesterenko, Petr S., 4,132,852, Cl. 13-32.000.

Stevens, Curtis E., to Bertea Corporation. Control system for aircraft. 4,132,378, Cl. 244-175.000.

Stevens, Keith D.: *See—*
Morton, John; and Stevens, Keith D., 4,132,934, Cl. 318-382.000.

Stewart, Donald M.: *See—*
Heimburg, Richard W.; and Stewart, Donald M., 4,132,179, Cl. 110-211.000.

Stewart, Marvin A.: *See—*
Anderson, David K.; and Stewart, Marvin A., 4,132,652, Cl. 210-536.000.

Stinnett, M. Wayne. Combined household heating and cooling unit for air and water. 4,132,263, Cl. 165-48.00R.

Stirling, Irene: *See—*
Howarth, Thomas T.; Stirling, Irene; and Corbett, David F., 4,132,712, Cl. 260-307.0FA.

Stoller, Patricia S.: *See—*
Van Dyke, Ronald D.; Hammonds, James C.; and Stoller, Patricia S., 4,132,327, Cl. 220-244.000.

Stone, Aubrey L.: *See—*
Coleman, Richard L.; Witte, Arnold C., Jr.; and Stone, Aubrey L., 4,132,658, Cl. 252-37.700.

Stone, Thomas D., to Intonation Systems. Fretted musical instrument with detachable fingerboard for providing multiple tonal scales. 4,132,143, Cl. 84-314.000.

Stork Brabant B.V.: *See—*
Verbakel, Godefridus H. W., 4,131,973, Cl. 17-52.000.

Storm, Fredrick P., Jr.: *See—*
Alexion, Dennis G.; and Storm, Fredrick P., Jr., 4,132,604, Cl. 203-87.000.

Story, William. Apparatus repairing damage to a surface. 4,132,516, Cl. 425-13.000.

Stotler, Charles L., Jr.: *See—*
Adamson, Arthur P.; Sargisson, Donald F.; and Stotler, Charles L., Jr., 4,132,069, Cl. 60-226.00R.

Stoughton, Richard B., to Nelson Research & Development Company. Method for treatment of acne. 4,132,781, Cl. 424-181.000.

Stoyakin, Vyacheslav P.: *See—*
Gurevich, Vladimir Z.; Prashin, Anatoly A.; Stoyakin, Vyacheslav P.; Ter-Minosian, Sergei M.; Frolov, Valery A.; Tolstykh, Viktor S.; Bogansky, Vasily V.; and Ivanenko, Gennady V., 4,132,339, Cl. 228-103.000.

Stratabolt Corporation: *See—*
Hansen, Roger M., 4,132,080, Cl. 405-261.000.

Straubel, Max; Ritter, Ernst; Maier, Sieghart; and Lehmann, Werner, to Robert Bosch GmbH. Centrifugal force speed governor for internal combustion engines with fuel injection. 4,132,206, Cl. 123-140.00R.

Streifer, William; Scifres, Donald R.; and Burnham, Robert D., to Xerox Corporation. Single longitudinal mode GaAs/GaAlAs double heterostructure laser. 4,132,960, Cl. 331-94.50H.

Striebel, Edmund E.: *See—*
Austin, George W., Jr.; Breton, Robert A.; Nolan, James J.; and Striebel, Edmund E., 4,132,066, Cl. 60-39.650.

Stritzl, Karl: *See—*
Svoboda, Josef; and Stritzl, Karl, 4,132,426, Cl. 280-11.37E.

Strobel, Albert F., to GAF Corporation. Method of and composition for screening erythema inducing ultraviolet bands. 4,132,774, Cl. 424-60.000.

Stroemer, John R.: *See—*
Sousek, Eugene A.; Stroemer, John R.; and Whitsitt, Steven L., 4,132,941, Cl. 318-663.000.

Strong, Howard D. Compressible bow adjuster. 4,132,488, Cl. 403-60.000.

Sturwold, Robert J., to Emery Industries, Inc. Rolling oil for aluminous metals. 4,132,662, Cl. 252-56.00R.

Suehiro, Hiroshi: *See—*
Hiroshima, Minoru; Yoshizawa, Shigeru; Saito, Nobuo; Asano, Atsushi; Suehiro, Hiroshi; Saitoh, Minoru; and Mise, Keisuke, 4,133,043, Cl. 365-15.000.

Suganuma, Yasuo; and Izumi, Toshio, to Izumi Products Company. Hydraulic compression tool. 4,132,107, Cl. 72-416.000.

Sugimoto, Shoichi: *See—*
Masuda, Noboru; and Sugimoto, Shoichi, 4,132,970, Cl. 338-32.00R.

Sugimura, Shigeru: *See—*
Ikeda, Isamu; and Yamada, Kunimitsu, 4,132,498, Cl. 61-39.000.

Sullivan, Paul F.: *See—*
Hottel, Hoyt C., Jr.; Brown, Robert A.; Moore, Randall W.; and Sullivan, Paul F., 4,132,462, Cl. 350-117.000.

Sullivan, Ralph G., to Dayton Sure-Grip & Shore Company, The. Reinforcing bar support. 4,132,045, Cl. 52-685.000.

Sulzer Brothers Limited: *See—*
Schiess, Oskar; and Huber, Franz, 4,132,368, Cl. 242-47.010.

Sumitomo Bakelite Company Limited: *See—*
Watanabe, Tsutomu; and Aso, Tetsuo, 4,132,747, Cl. 260-857.0PE.

Sumiyoshi, Masaharu: *See—*
Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Yukiyasu; and Tanaka, Taro, 4,132,212, Cl. 123-191.00S.

Sun Oil Company of Pennsylvania: *See—*
Bottomley, James C.; and Nash, Henry G., 4,132,645, Cl. 210-104.000.
Merges, John C., Jr., 4,132,591, Cl. 162-146.000.

Sunami, Teruo; Morishita, Tsuyoshi; and Hatakeyama, Kazumi, to Toyo Kogyo Co., Ltd. Oil seal ring for rotary piston engines. 4,132,419, Cl. 277-96.200.

Suntech, Inc.: *See—*
Lyons, James E.; Schneider, Abraham; and Myers, Harry K., Jr., 4,132,742, Cl. 260-668.00A.
Norton, Richard V., 4,132,711, Cl. 546-286.000.

Suska, Charles R., to Stanley Works, The. Security stud for hinges. 4,131,969, Cl. 16-137.000.

Sutton, James A.: *See—*
Walker, John H.; and Sutton, James A., 4,132,081, Cl. 405-296.000.

Sutton, Richard C.: *See—*
Eikenberry, Jon N.; Sanford, Karl J.; and Sutton, Richard C., 4,132,528, Cl. 23-230.00B.

Suyama, Eizo: *See—*
Hasui, Hiroshi; and Suyama, Eizo, 4,132,286, Cl. 181-265.000.

Suzuki, Kiyoshi: *See—*
Suzuki, Masane; and Suzuki, Kiyoshi, 4,132,575, Cl. 156-58.000.

Suzuki, Masane; and Suzuki, Kiyoshi, to Fuji Photo Optical Co., Ltd. Method of producing three-dimensional replica. 4,132,575, Cl. 156-58.000.

Suzuki, Norimoto: *See—*
Kubota, Tetsuo; Noshiro, Atsumi; and Suzuki, Norimoto, 4,132,350, Cl. 235-493.000.

Suzuki, Tameyuki: *See—*
Toyoshima, Kazuaki; Koyanagi, Michitoshi; and Suzuki, Tameyuki, 4,132,686, Cl. 260-21.000.

Suzuki, Tomio, to Minolta Camera Kabushiki Kaisha. Sheet advancing and positioning device. 4,132,475, Cl. 355-3.00R.

Svatek, Thomas A.; and Wareham, Richard R., to Polaroid Corporation. Expandable self-developing camera. 4,132,471, Cl. 354-86.000.

Svensson, Torbjorn, to Linden-Alimak AB. Arrangement for forming vertical or steeply inclined shafts. 4,132,276, Cl. 173-1.000.

Svitenko, Igor A.: *See—*
Rabinovich, Volf I.; Kriger, Jury N.; Svitenko, Igor A.; and Sapunov, Viktor E., 4,132,545, Cl. 75-10.00C.

Svoboda, Josef; and Stritzl, Karl, to TMC Corporation. Device for fastening an attachment to a ski. 4,132,426, Cl. 280-11.37E.

Swartz, Henry D., to Standard Oil Company (Indiana). Method for the fabrication of plasticboard. 4,132,581, Cl. 156-208.000.

Sycor, Inc.: *See—*
Butsch, Otto R., 4,133,015, Cl. 360-109.000.

Symmanek, Horst: *See—*
Erdmann, Otto; Deutsch, Reinhard; Symmanek, Horst; and Rudszinat, Willy, 4,132,398, Cl. 271-9.000.

Szechenyi, Kalman, to International Standard Electric Corporation. Electronic switch. 4,132,865, Cl. 179-18.0GF.

Szymber, Oleg: *See—*
Culver, Irven H.; and Szymber, Oleg, 4,132,098, Cl. 72-102.000.

Tachikawa, Hajime; Satoh, Kenji; and Watanabe, Mitsuru, to Hitachi Heating Appliances Co., Ltd. High-frequency energy apparatus. 4,132,878, Cl. 219-10.55B.

Tachikawa, Sadao: *See—*
Shigemasa, Junichiro; Ohno, Takashi; and Tachikawa, Sadao, 4,132,899, Cl. 250-577.000.

Taganrogsky Zavod Krasny Kotelschik: *See—*
Gurevich, Vladimir Z.; Prashin, Anatoly A.; Stoyakin, Vyacheslav P.; Ter-Minosian, Sergei M.; Frolov, Valery A.; Tolstykh, Viktor S.; Bogansky, Vasily V.; and Ivanenko, Gennady V., 4,132,339, Cl. 228-103.000.

Tahiliani, Vasu H.: *See—*
Clark, Robert M.; Cronin, John C.; Reighter, David H.; and Tahiliani, Vasu H., 4,132,855, Cl. 174-28.000.

Taiheiyo Engineering Incorporated: *See—*
Ito, Tsunetoshi; and Inoue, Hideo, 4,132,079, Cl. 405-299.000.

Takahashi, Fujio; and Tsujimura, Harutoshi, to Nissan Motor Company, Limited; and Ikeda Bussan Company, Limited. Vehicle seat and safety seat belt assembly. 4,132,434, Cl. 280-744.000.

Takahashi, Isao: *See—*
Sato, Minoru; Takahashi, Isao; Kurasawa, Takanao; Yoshioka, Yoshio; and Nakagawa, Yukio, 4,132,876, Cl. 200-148.00A.

Takahashi, Kenji: *See—*
Seita, Toru; Takahashi, Kenji; Asami, Shunichi; and Shimizu, Akihiko, 4,132,682, Cl. 521-27.000.

Takahashi, Shigeo, to Sampei Komiya. Compressor. 4,132,510, Cl. 417-534.000.

Takaki, Noboru: *See—*
Yamada, Hirofumi; Takaki, Noboru; and Masuda, Michio, 4,132,590, Cl. 162-145.000.

Takamiya, Takehisa; Yano, Yoshiro; and Nakamura, Yuji, to Matsushita Electric Industrial Co., Ltd. Magnetic recording and reproducing device. 4,133,012, Cl. 360-90.000.

Takara Co., Ltd.: *See—*
Ogawa, Iwakichi, 4,132,028, Cl. 46-17.000.

Takase, Sadao; Asano, Masaharu; and Nagai, Tadashi, to Nissan Motor Company, Limited. Exhaust gas temperature detection for fuel control systems. 4,132,193, Cl. 123-32.0EE.

Takasu, Yoshio: *See—*
Endo, Ichiro; Komatsu, Toshiyuki; and Takasu, Yoshio, 4,132,882, Cl. 219-216.000.

Takasugi, Kazuo: *See—*
Maio, Kenji; Inose, Fumiyuki; Yokozawa, Norio; Fujimoto, Ryoichi; and Takasugi, Kazuo, 4,132,085, Cl. 62-155.000.

Takeda Chemical Industries, Ltd.: *See—*
Nomura, Hiroaki; Hitaka, Takenori; Akimoto, Hiroshi; Minami, Isao; Kiriki, Fumio; Matsuda, Tatsuichi; and Fugono, Takeshi, 4,132,789, Cl. 424-246.000.

Takenaga, Senzo. Means for forming a structure of an optional curve. 4,132,391, Cl. 256-59.000.

Tamborski, Christ: *See—*
Christian, John B.; and Tamborski, Christ, 4,132,660, Cl. 252-51.50R.

Tamura, Sachiko: *See—*
Hashimoto, Tohru; Kawarada, Akira; and Tamura, Sachiko, 4,132,541, Cl. 71-76.000.

Tan, Chee T.: *See—*
Haber, George J.; Tan, Chee T.; and Wu, Joanna, 4,132,793, Cl. 426-250.000.

Tanaka, Taro: *See—*
Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Yukiyasu; and Tanaka, Taro, 4,132,212, Cl. 123-191.00S.

Tanaka, Toshio: *See—*
Kurozumi, Seizi; Toru, Takeshi; Tanaka, Toshio; Miura, Shuzi; Kobayashi, Makiko; Ishimoto, Sachio; and Matsubara, Sadakazu, 4,132,726, Cl. 260-448.80R.

Tanaka, Yukiyasu: *See—*
Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Yukiyasu; and Tanaka, Taro, 4,132,212, Cl. 123-191.00S.

Tanguy, Pierre, to SEB S.A. Apparatus driven by an electric motor and incorporating a safety device. 4,133,016, Cl. 361-23.000.

Tanner, Hans: *See—*
Baumann, Gerhard; Tanner, Hans; and Wuchner, Xaver, 4,132,495, Cl. 408-74.000.

Tannetics, Inc.: *See—*
Iannelli, Frank M., 4,132,241, Cl. 137-102.000.

Tantram, Anthony D. S.; Kent, Michael J.; and Palmer, Alan G., to City Technology Limited. Gas sensor. 4,132,616, Cl. 204-195.00P.

Tapis, Claude. Method of manufacturing a resin concrete. 4,132,701, Cl. 260-42.000.

Tashiro, Korefumi: *See—*
Terunuma, Mutsuhiro; Shima, Seiya; Tashiro, Korefumi; Ando, Takeki; Inaba, Hiromi; Kurosawa, Toshiaki; and Kuroha, Hiroaki, 4,133,018, Cl. 361-87.000.

Taurus Corporation: *See—*
Salberta, Richard A., 4,132,352, Cl. 235-456.000.

Taylor, Anthony E. Police baton with rotatable crosshandle. 4,132,409, Cl. 273-84.00R.

Taylor, Barbara S.: *See—*
Castor, William M.; and Taylor, Barbara S., 4,132,743, Cl. 260-669.00R.

Taylor, Herbert D. B.: *See—*
Bartlett, Peter J.; and Taylor, Herbert D. B., 4,132,646, Cl. 210-114.000.

Teague, Kenneth W., to Chrysler Corporation. Fuel spray bar and pressure regulator system. 4,132,204, Cl. 123-139.0AW.

Techno-Components Corp.: *See—*
Tumbusch, Edward H., 4,132,972, Cl. 338-180.000.

Teich, Wesley W.: *See—*
Bowen, Robert F.; and Teich, Wesley W., 4,132,239, Cl. 137-382.000.

Teijin Limited: *See—*
Kurozumi, Seizi; Toru, Takeshi; Tanaka, Toshio; Miura, Shuzi; Kobayashi, Makiko; Ishimoto, Sachio; and Matsubara, Sadakazu, 4,132,726, Cl. 260-448.80R.

Teijin Seiki Company Limited: *See—*
Nishiba, Kenzo, 4,132,154, Cl. 91-491.000.

Tejima, Yasuyuki: *See—*
Doi, Yuzuru; Kawahara, Masanao; and Tejima, Yasuyuki, 4,132,036, Cl. 51-124.00L.

Tektronix, Inc.: *See—*
Addis, John L.; and Hofer, Bruce E., 4,132,958, Cl. 330-252.000.

Telatemp Corporation: *See—*
Everest, Charles E., 4,132,902, Cl. 307-116.000.

Teledyne Industries, Inc.: *See—*
Campbell, Joseph M.; and Finley, William S., 4,132,141, Cl. 84-115.000.
Campbell, Joseph M., 4,132,142, Cl. 84-115.000.

Teletype Corporation: *See—*
Heeren, Richard H., 4,132,979, Cl. 340-147.00P.

Telex Computer Products, Inc.: *See—*
Painter, Alan; O'Neill, Daniel R.; and Glaeser, George L., Jr., 4,132,607, Cl. 204-9.000.

Telic Corporation: *See—*
Penfold, Alan S.; and Thornton, John A., 4,132,612, Cl. 204-192.00R.
Penfold, Alan S.; and Thornton, John A., 4,132,613, Cl. 204-192.00R.

Tench, Dennis M.; and Ogden, Cameron A., to Rockwell International Corporation. Method for evaluating the quality of electroplating baths. 4,132,605, Cl. 204-1.00T.

Terada, Takami, to Aisin Seiki Kabushiki Kaisha. Hinge fitting for adjustable vehicle seat. 4,132,447, Cl. 297-367.000.

Teradyne, Inc.: *See—*
Katz, Jonathon H., 4,132,948, Cl. 324-158.00F.

Ter-Minosian, Sergei M.: *See*—
Gurevich, Vladimir Z.; Prashin, Anatoly A.; Stoyakin, Vyacheslav P.; Ter-Minosian, Sergei M.; Frolov, Valery A.; Tolstykh, Viktor S.; Bogansky, Vasily V.; and Ivanenko, Gennady V., 4,132,339, Cl. 228-103.000.

Terunuma, Mutsuhiro; Shima, Seiya; Tashiro, Korefumi; Ando, Takeki; Inaba, Hiromi; Kurosawa, Toshiaki; and Kuroha, Hiroaki, to Hitachi, Ltd. Thyristor fault-detecting apparatus. 4,133,018, Cl. 361-87.000.

Tetra Pak Developpement SA: *See*—
Rausing, Ruben A., 4,132,051, Cl. 53-452.000.

Texaco Inc.: *See*—
Coleman, Richard L.; Witte, Arnold C., Jr.; and Stone, Aubrey L., 4,132,658, Cl. 252-37.700.
Cummings, William M.; and Powell, Justin C., 4,132,531, Cl. 44-63.000.
Harrison, Robert J., deceased, 4,132,268, Cl. 166-244.00C.
Knifton, John F., 4,132,744, Cl. 260-677.00A.
McGann, Rodney, 4,132,065, Cl. 60-39.020.
Waldbillig, James O.; and Cusano, Carmen M., 4,132,661, Cl. 252-51.50A.

Texas Gas Transmission Corporation: *See*—
Gomberg, Henry J., 4,132,727, Cl. 260-449.500.

Texas Instruments Incorporated: *See*—
Cochran, Michael J.; and Caudel, Edward R., 4,132,950, Cl. 325-25.000.
Cochran, Michael J.; and Caudel, Edward R., 4,132,951, Cl. 325-452.000.
Matzen, Walter T., 4,131,983, Cl. 29-571.000.
Williams, Clark R., 4,132,059, Cl. 58-23.00A.

Textile Mouldings Limited: *See*—
Eadie, Brian K. M.; Craighead, James W.; McKerrell, Alistair A.; Wilson, Robert; and White, William A., 4,132,058, Cl. 57-125.000.

Textile Rubber and Chemical Co., Inc.: *See*—
Tillotson, John G., 4,132,817, Cl. 427-244.000.

Thackery, Russell H. Tractor mounted log splitting apparatus. 4,132,255, Cl. 144-193.00R.

Thiers, Robrecht J.: *See*—
Pollet, Robert J.; Thiers, Robrecht J.; Ghys, Theofiel H.; Vandenberghe, Antoon L.; Philippaerts, Herman A.; and Vandenabeele, Hubert, 4,132,551, Cl. 96-66.500.

Thomason, Harry E. Solar energy collector. 4,132,220, Cl. 126-271.000.

Thompson, Scott; and Chidester, James T., to Positive Pyramids, Inc. Pyramid flyer. 4,132,029, Cl. 46-74.00D.

Thomson-CSF: *See*—
Dubroeucq, Georges; and Lacombat, Michael, 4,132,479, Cl. 355-71.000.
Jacques, Andre; d'Auria, Luigi; and Moronville, Chantal, 4,132,461, Cl. 350-96.200.

Thornton, John A.: *See*—
Penfold, Alan S.; and Thornton, John A., 4,132,612, Cl. 204-192.00R.
Penfold, Alan S.; and Thornton, John A., 4,132,613, Cl. 204-192.00R.

Tiemens, Ulf: *See*—
Klotz, Erhard; and Tiemens, Ulf, 4,132,896, Cl. 250-445.00T.

TII Corporation: *See*—
Roach, Alfred J.; and Roberts, Charles, 4,133,019, Cl. 361-124.000.

Tillotson, John G., to Textile Rubber and Chemical Co., Inc. Method for forming a layer of blown cellular urethane on a carpet backing. 4,132,817, Cl. 427-244.000.

Timberlake, Cecil H.; Viverette, Willie E., Jr.; and Davidson, John B., to Phillips Petroleum Company. Method and apparatus suitable for gripping an annular workpiece. 4,132,443, Cl. 294-97.000.

Tison, Kenneth F., to Marine Construction & Design Co. Gangion enwrapment control apparatus for long line haulers. 4,132,025, Cl. 43-4.000.

Tisue, James G., to Rapicom Inc. Automatic illumination compensation circuit. 4,133,008, Cl. 358-282.000.

Tjurin, Vladimir D.: *See*—
Nametkin, Nikolai S.; Matveev, Mikhail S.; Gubin, Sergei P.; Dekhterman, Abram S.; Tjurin, Vladimir D.; Skibenko, Anatoly P.; Orlova, Valentina S.; Savenko, Alevtina I.; and Podolskaya, Irina P., 4,132,631, Cl. 208-236.000.

Tkach, Khaim B.: *See*—
Tupitsyn, Konstantin K.; Cherednikov, Evgeny N.; Kostylev, Alexandr D.; Plavskikh, Vladimir D.; Klimashko, Vladimir V.; Tkach, Khaim B.; and Karavaev, Andron T., 4,132,277, Cl. 175-19.000.

TMC Corporation: *See*—
Svoboda, Josef; and Stritzl, Karl, 4,132,426, Cl. 280-11.37E.

Tobioka, Takashi, to Fuji Photo Optical Co., Ltd. Film end indicating device for motion picture cameras. 4,132,467, Cl. 352-172.000.

Todd, Judson D.: *See*—
Volenec, Frank J.; and Todd, Judson D., 4,132,775, Cl. 424-89.000.

Todeschini, Eugenio, to Massey-Ferguson Services N.V. Hydrostatic transmissions. 4,132,278, Cl. 180-6.480.

Tohmatsu, Jun-ichi; Morimoto, Tomiaki; and Kishi, Emiko, to Eisai Co., Ltd. Preparation of α-L antibody, purification of α-L antigen and reagent for detection of α-L antibody and α-L antigen. 4,132,767, Cl. 424-1.000.

Toho Beslon Co., Ltd.: *See*—
Nakamura, Kazuo; Fukube, Yoshito; and Osaki, Takashi, 4,132,828, Cl. 428-366.000.

Tokico Limited: *See*—
Sano, Sinitiro; Kuroda, Noriaki; and Sakai, Tsuyoshi, 4,132,938, Cl. 318-568.000.

Tokumitsu, Yukiko: *See*—
Ui, Michio; and Tokumitsu, Yukiko, 4,132,768, Cl. 424-1.000.

Toledo Stamping & Manufacturing Company: *See*—
Wherry, Joseph L., 4,132,196, Cl. 123-90.390.

Tolstykh, Viktor S.: *See*—
Gurevich, Vladimir Z.; Prashin, Anatoly A.; Stoyakin, Vyacheslav P.; Ter-Minosian, Sergei M.; Frolov, Valery A.; Tolstykh, Viktor S.; Bogansky, Vasily V.; and Ivanenko, Gennady V., 4,132,339, Cl. 228-103.000.

Tomecek, Jerry J. Electronic cruise control. 4,132,284, Cl. 180-105.00E.

Tomioka, Shinji; Mori, Yasuki; and Shirahata, Kunikatsu, to Abbott Laboratories. 1-N-(α-Hydroxy-β-aminopropionyl) XK-62-2 and method of production thereof. 4,132,846, Cl. 536-17.000.

Torper, Udo: *See*—
Kreft, Robert; and Torper, Udo, 4,132,503, Cl. 416-167.000.

Toru, Takeshi: *See*—
Kurozumi, Seizi; Toru, Takeshi; Tanaka, Toshio; Miura, Shuzi; Kobayashi, Makiko; Ishimoto, Sachio; and Matsubara, Sadakazu, 4,132,726, Cl. 260-448.80R.

Toyo Kogyo Co., Ltd.: *See*—
Sunami, Teruo; Morishita, Tsuyoshi; and Hatakeyama, Kazumi, 4,132,419, Cl. 277-96.200.

Toyo Soda Manufacturing Co., Ltd.: *See*—
Seita, Toru; Takahashi, Kenji; Asami, Shunichi; and Shimizu, Akihiko, 4,132,682, Cl. 521-27.000.
Yokoyama, Yasukazu; and Iwamoto, Eiji, 4,132,851, Cl. 544-245.000.

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Ishii, Hakumi; Sogo, Yoshitaka; and Ida, Shuichiro, 4,132,123, Cl. 74-473.0SW.

Treace, James T., to Richards Manufacturing Company, Inc. Elbow prosthesis. 4,131,956, Cl. 3-1.910.

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Becker, Charles H., 4,132,145, Cl. 85-32.00R.
Glorioso, Paul A., 4,132,879, Cl. 219-98.000.
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Takahashi, Fujio; and Tsujimura, Harutoshi, 4,132,434, Cl. 280-744.000.

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Scarola, Leonard S.; and White, Charles E., 4,132,857, Cl. 174-107.000.
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Dorsch, Robert E., 4,132,310, Cl. 206-386.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Bolton, Colin B.; and Hermer, Gerald P., 4,131,974, Cl. 9-337.000.
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Air Force: *See*—
Blacksmith, Philipp; Poirier, J. Leon; and Holt, Frederick S., 4,132,988, Cl. 340-552.000.
Christian, John B.; and Tamborski, Christ, 4,132,660, Cl. 252-51.50R.
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Berlin, Howard M., 4,132,928, Cl. 315-377.000.
Conn, Donald J., 4,132,150, Cl. 89-1.806.
Cunningham, Peter E., 4,132,945, Cl. 324-58.00C.
F'Geppert, Erwin, 4,132,298, Cl. 192-53.00B.
Mikaila, Joseph J., 4,132,271, Cl. 169-62.000.
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Katz, Sidney; and Rodgers, Billy R., 4,132,639, Cl. 210-51.000.
Pell, Melvyn B., 4,132,628, Cl. 208-108.000.
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Schindler, Rudolf A. Apparatus for providing a servo drive signal in a high-speed stepping interferometer. 4,132,940, Cl. 318-640.000.
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Adamson, Arthur P.; Sargisson, Donald F.; and Stotler, Charles L., Jr., 4,132,069, Cl. 60-226.00R.
Bank, Herman; and Cleland, Edward L., 4,132,594, Cl. 195-1.800.
Johnston, Everett A., 4,132,068, Cl. 60-226.00A.
Lamar, John E., 4,132,375, Cl. 244-90.00R.
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Field, Donald E.; and Griffith, James R., 4,132,681, Cl. 260-836.000.
Gariazzo, Michael C.; and Haynes, Leonard S., 4,133,044, Cl. 365-78.000.
Reader, Kenneth R.; and Wilkerson, Joseph B., 4,132,500, Cl. 416-20.00R.
Seeley, Robert L.; and Flanigan, William F., 4,132,226, Cl. 128-2.10R.
Wynne, Kenneth J.; and Davison, John B., 4,132,842, Cl. 528-33.000.
U.S. Philips Corporation: *See*—
Bouwhuis, Gijsbertus; and van der Wal, Johannes, 4,132,959, Cl. 331-94.50C.
Klotz, Erhard; and Tiemens, Ulf, 4,132,896, Cl. 250-445.00T.
Pavlik, Klaus J., 4,131,987, Cl. 29-593.000.
van Heek, Herman F., 4,132,470, Cl. 354-1.000.
Warringa, Jozef J. M.; and Piepers, Harry, 4,132,965, Cl. 333-73.00R.
United States Steel Corporation: *See*—
Bowman, Richard J., 4,132,095, Cl. 72-8.000.
Seaton, John J.; and Slagle, James K., 4,132,096, Cl. 72-21.000.
United Technologies Corporation: *See*—
Austin, George W., Jr.; Breton, Robert A.; Nolan, James J.; and Striebel, Edmund E., 4,132,066, Cl. 60-39.650.
Benden, Robert S.; and Parzuchowski, Richard S., 4,132,816, Cl. 427-237.000.
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Tsai, Min H., 4,132,830, Cl. 428-450.000.
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Urry, Dan W.; and Okamoto, Kouji, 4,132,746, Cl. 260-857.0TW.
University Patents, Inc.: *See*—
Jeter, Wayburn S., 4,132,776, Cl. 424-101.000.
Soffer, Abraham, 4,132,837, Cl. 429-194.000.
UOP Inc.: *See*—
Schwimmer, Michael F., 4,132,529, Cl. 23-230.00A.
Schwimmer, Michael F., 4,132,530, Cl. 23-230.00A.
Upjohn Company, The: *See*—
Greig, Margaret E., 4,132,804, Cl. 424-317.000.
Urano, Fumio; Arai, Akihiro; Kobayashi, Takumi; and Umetsu, Junji, to Asahi Kogaku Kogyo Kabushiki Kaisha. Replaceable finder system for single-lens reflex camera. 4,132,472, Cl. 354-155.000.
Urciola, John A.: *See*—
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Ishige, Sadao; Usui, Hideo; and Saeki, Keiso, 4,132,436, Cl. 282-27.500.
Utter, Gordon F. Vegetation cutting apparatus having a semiautomatically dispensed flexible line cutting element. 4,131,997, Cl. 30-276.000.
Vaccari, Franco. Shoe, particularly for general sporting activities and training. 4,132,016, Cl. 36-114.000.
Vainshtein, Galina L.: *See*—
Arendt, Georgy A.; Pokrovsky, Vladimir V.; Burov, Boris A.; Lipovich, Alexandr L.; Romanov, Evgeny I.; Vainshtein, Galina L.; and Khaitovich, Tsalel S., 4,132,317, Cl. 212-49.000.
Valdsaar, Herbert, to Du Pont de Nemours, E. I., and Company. Abrasive particles consisting of crystalline titanium diboride in a metal carbide matrix. 4,132,534, Cl. 51-307.000.
VanAuken, Richard L., to Exxon Research & Engineering Co. Golf shaft and method of making same. 4,132,579, Cl. 156-189.000.
Vandenabeele, Hubert: *See*—
Pollet, Robert J.; Thiers, Robrecht J.; Ghys, Theofiel H.; Vandenberghe, Antoon L.; Philippaerts, Herman A.; and Vandenabeele, Hubert, 4,132,551, Cl. 96-66.500.
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Van den Broek, Bernardus C. Telescopic apparatus. 4,132,041, Cl. 52-118.000.
van der Lely, Cornelis. Soil cultivating implements. 4,132,274, Cl. 172-59.000.
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van der Lende, Leendert J.; and Zwaanswijk, Michel L. Automotive tractor unit, more particularly for riding and working on vertical walls, ceilings and suchlike. 4,132,279, Cl. 180-9.500.
Vanderpoel, Cornelius, to General Time Corporation. Multiposition switch. 4,132,873, Cl. 200-6.00R.
VanderSyde, Gary L., to Alcohol Countermeasure Systems, Inc. Breath testing system. 4,132,109, Cl. 73-23.000.
van der Wal, Johannes: *See*—
Bouwhuis, Gijsbertus; and van der Wal, Johannes, 4,132,959, Cl. 331-94.50C.
Van Dyke, Ronald D.; Hammonds, James C.; and Stoller, Patricia S., to ACF Industries, Inc. Hatch cover opening and closing assembly. 4,132,327, Cl. 220-244.000.
Van Gossum, Lucien J.: *See*—
Van Paesschen, August J.; Van Gossum, Lucien J.; and Priem, Jan J., 4,132,552, Cl. 96-87.00R.
van Heek, Herman F., to U.S. Philips Corporation. Exposure device for the manufacture of display screens of color television display tubes and display tube manufactured by means of such a device. 4,132,470, Cl. 354-1.000.
Van Meter, James A. Matchbook structure. 4,132,307, Cl. 206-115.000.
van Mullekom, Hubert P., to Ruti-Te Strake B.V. Device for forming a supply bobbin from a thread advanced from a yarn supply. 4,132,370, Cl. 242-47.120.
van Os, Jan L.; Oldenkamp, Engbert P.; and Smink, Dirk A., to Gist-Brocades N.V. Antifungal compositions and method. 4,132,777, Cl. 424-119.000.
Van Paesschen, August J.; Van Gossum, Lucien J.; and Priem, Jan J., to AGFA-GEVAERT N.V. Dimensionally stable polyester film supports with subbing layer thereon. 4,132,552, Cl. 96-87.00R.
Van Siclen, William C. Refrigerator door with double acting hinge. 4,132,034, Cl. 49-382.000.
Varga, Istvan: *See*—
Lehner, Aladar; and Varga, Istvan, 4,132,425, Cl. 280-11.230.
Vargiu, Silvio; Pitzalis, Mario; Crespolini, Giancarlo; and Giuliani, Gino, to Societa' Italiana Resine S.I.R. S.p.A. Preparation of liquid epoxy resins from bisphenols. 4,132,718, Cl. 260-348.150.
Varian Associates, Inc.: *See*—
Boehme, Detlef R.; Judah, Kenneth C.; and Luchetti, Stephen J., 4,132,511, Cl. 417-540.000.
Escriva, Vincent R.; Kirtikar, Suvrat; Marshall, Edward W.; and Minard, Charles D., 4,131,986, Cl. 29-592.00R.
VDO Adolf Schindling AG: *See*—
Stein, Manfred, 4,132,905, Cl. 307-247.00A.
Vdovin, Valentin M.: *See*—
Gryaznov, Vladimir M.; Smirnov, Viktor S.; Vdovin, Valentin M.; Ermilova, Margarita M.; Gogua, Lia D.; Pritula, Nina A.; and Litvinov, Igor A., 4,132,668, Cl. 252-430.000.
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Weisbach, Gunter; and Wege, Regina, 4,132,403, Cl. 271-277.000.
Veba-Chemie Aktiengesellschaft: *See*—
Deininger, Gunter; and Soyez, Werner, 4,132,671, Cl. 252-445.000.
Veda, Inc.: *See*—
Hansen, Glen D., 4,132,450, Cl. 302-56.000.

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Fleischer, Donald W., 4,132,887, Cl. 235-92.0FL.

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Verberne, Petrus; Zwitserloot, Wilhelmus R. M.; and Nauta, Robijn R., to Scholten-Honig Research B.V. Method for the separation of wheat gluten and wheat starch. 4,132,566, Cl. 127-65.000.

Verbrugge, Pieter A.; and Kramer, Petrus A., to Shell Oil Company. Preparation of nitriles. 4,132,728, Cl. 260-465.00G.

Verdicchio, Robert J.; and Nehmsmann, Louis J., III, to GAF Corporation. Treatment of metal surfaces. 4,132,657, Cl. 252-32.500.

Vereinigte Osterreichische Eisen-und Stahlwerke - Alpine Montan Aktiengesellschaft: *See—*
Riegler, Ernst; and Schmidt, Manfred, 4,132,452, Cl. 308-3.00R.

Vernon, Eugene G. Ribbed inner shell for a hull of a catamaran. 4,131,962, Cl. 9-6.00P.

Vernon, John H.: *See—*
Huettner, Robert E.; Grandmaison, John P.; Vernon, John H.; Lemay, Richard A.; and Beauchemin, Edward, 4,133,030, Cl. 364-200.000.

Verschuur, Eke, to Shell Oil Company. Process for preparing a stable slurry of coal. 4,132,365, Cl. 241-21.000.

Vessa Limited: *See—*
Chant, John B., 4,132,423, Cl. 280-5.300.

Vianova Kunstharz, A.G.: *See—*
Behmel, Klaus; Schmut, Wolfgang; and Zuckert, Bertram, 4,132,687, Cl. 260-22.00A.

Vidakovic, Aleksandar; and Salna, Karl, to International Harvester Company. Armored tire. 4,132,258, Cl. 152-185.000.

Virgilio, Joseph A., to Givaudan Corporation. Perfume compositions containing ethyl 3,4-dichloro-5-isothiazolecarboxylate. 4,132,676, Cl. 252-522.000.

Viverette, Willie E., Jr.: *See—*
Timberlake, Cecil H.; Viverette, Willie E., Jr.; and Davidson, John B., 4,132,443, Cl. 294-97.000.

Voj, Peter: *See—*
Benemann, Annelie; Schult, Norbert; Voj, Peter; and Hosemann, Bernhard, 4,132,115, Cl. 73-349.000.

Volenec, Frank J.; and Todd, Judson D., to Richardson-Merrell Inc. Infectious bovine rhinotracheitis virus vaccine and method of preparing and using the same. 4,132,775, Cl. 424-89.000.

Volkswagenwerk Aktiengesellschaft: *See—*
Milde, Wilhelm; and Hoheisel, Gerhard, 4,132,285, Cl. 181-258.000.

Von Roll AG: *See—*
Filzmoser, Ernst, 4,132,640, Cl. 210-68.000.

von Beckmann, Joerg W.; and Bulley, Norman R., to von Beckmann, Joerg Walter. Electronic size and color sorter. 4,132,314, Cl. 209-565.000.

von Beckmann, Joerg Walter: *See—*
von Beckmann, Joerg W.; and Bulley, Norman R., 4,132,314, Cl. 209-565.000.

von den Benken, Elisabeth: *See—*
von den Benken, Henry; and von den Benken, Elisabeth, 4,131,965, Cl. 12-86.700.

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von der Crone, Jost: *See—*
L'Eplattenier, Francois; Pugin, Andre; and von der Crone, Jost, 4,132,708, Cl. 546-7.000.

von der Ohe, Manfred, to Daimler-Benz Aktiengesellschaft. Wheel suspension. 4,132,431, Cl. 280-691.000.

Voorheis, James T. Single burner heater and incinerator. 4,132,007, Cl. 34-35.000.

Vorontsov, Alexandr I.: *See—*
Khutoretsky, Garri M.; Vorontsov, Alexandr I.; Drozdova, Larisa A.; and Yanik, Boris S., 4,132,914, Cl. 310-184.000.

Vsesojuzny Proektno-Konstruktorsky Tekhnologichesky Institut Atomnogo Mashinostroenia: *See—*
Gurevich, Vladimir Z.; Prashin, Anatoly A.; Stoyakin, Vyacheslav P.; Ter-Minosian, Sergei M.; Frolov, Valery A.; Tolstykh, Viktor S.; Bogansky, Vasily V.; and Ivanenko, Gennady V., 4,132,339, Cl. 228-103.000.

W. R. Grace & Co.: *See—*
Marans, Nelson S.; and Pollack, Alan R., 4,132,839, Cl. 521-159.000.
Mathias, Eckart, 4,132,812, Cl. 427-44.000.

Wacker-Chemie GmbH: *See—*
Schmidt, Dietrich; Hofer, Johann; and Huber, Karl E., 4,132,763, Cl. 423-350.000.

Wagenaar, Loren B., to Westinghouse Electric Corp. Electrical bushing. 4,132,853, Cl. 174-12.0BH.

Wald, Stephen A.: *See—*
Hiers, John J.; and Wald, Stephen A., 4,132,821, Cl. 428-151.000.

Waldbillig, James O.; and Cusano, Carmen M., to Texaco Inc. Lubricating oil additives and composition containing same. 4,132,661, Cl. 252-51.50A.

Walker, Francis H.: *See—*
Arneklev, Duane R.; Baker, Don R.; and Walker, Francis H., 4,132,544, Cl. 71-118.000.

Walker, John H.; and Sutton, James A., to Dowty Mining Equipment Limited. Mine roof support. 4,132,081, Cl. 405-296.000.

Wallace, Ben W. Automatic pinsetter controller system. 4,133,042, Cl. 364-900.000.

Waller, Tracy N.: *See—*
Garcia, Joe L.; Hu, Paul Y.; and Waller, Tracy N., 4,132,890, Cl. 250-231.0SE.

Wang, Sherman S.; Wesley, Michael A.; and Will, Peter M., to International Business Machines Corporation. Asymmetric six-degree-of-freedom force-transducer system for a computer-controlled manipulator system. 4,132,318, Cl. 214-1.0BB.

Wanlass, Cravens L. Balanced split-phase electric motor. 4,132,932, Cl. 318-795.000.

Ward, Emerson. Mounting bracket for a pipe clamp. 4,132,397, Cl. 269-252.000.

Wareham, Richard R.: *See—*
Svatek, Thomas A.; and Wareham, Richard R., 4,132,471, Cl. 354-86.000.

Warner-Lambert: *See—*
Zinnes, Harold; and Lindo, Neil A., 4,132,792, Cl. 424-250.000.

Warringa, Jozef J. M.; and Piepers, Harry, to U.S. Philips Corporation. Band-pass filter constructed from concentrically arranged coaxial resonator cavities. 4,132,965, Cl. 333-73.00R.

Wason, Satish K., to J. M. Huber Corporation. Novel precipitated siliceous products. 4,132,806, Cl. 424-357.000.

Wassilieff, Victor. Containers for pressurized fluids, in particular for dispensing aerosols. 4,132,332, Cl. 222-387.000.

Watabe, Rokuro; Ohira, Makoto; and Sakai, Katsuo, to Ricoh Company, Ltd. Optical imaging system for electrophotography. 4,132,477, Cl. 355-11.000.

Watanabe, Hiroshi: *See—*
Iijima, Eiji; Watanabe, Hiroshi; and Hayashi, Shizuo, 4,132,678, Cl. 252-545.000.
Tsutsumi, Hisao; Watanabe, Hiroshi; and Hayashi, Shizuo, 4,132,679, Cl. 252-545.000.

Watanabe, Mitsuru: *See—*
Tachikawa, Hajime; Satoh, Kenji; and Watanabe, Mitsuru, 4,132,878, Cl. 219-10.55B.

Watanabe, Tsutomu; and Aso, Tetsuo, to Sumitomo Bakelite Company Limited. Heat-resistant molding resin composition. 4,132,747, Cl. 260-857.0PE.

Watkins, Murrell W. Head for removing fuse holder. 4,132,441, Cl. 294-19.00R.

Watson, Edward D.: *See—*
Somerville, William M.; and Watson, Edward D., 4,132,387, Cl. 254-173.00R.

Watson, James M., to Cosden Technology, Inc. Polymerization inhibitor for vinyl aromatic compounds. 4,132,601, Cl. 203-9.000.

Watson, James M., to Cosden Technology, Inc. Polymerization inhibitor for vinyl aromatic compounds. 4,132,602, Cl. 203-9.000.

Watson, James M., to Cosden Technology, Inc. Polymerization inhibitor for vinyl aromatic compounds. 4,132,603, Cl. 203-9.000.

Watson, Robert G., to Republic Steel Corporation. Method and system for monitoring a physical condition of a medium. 4,133,036, Cl. 364-477.000.

Watson, Stephen R.: *See—*
Gent, Ernest C.; and Watson, Stephen R., 4,132,304, Cl. 198-432.000.

Watts, Nicholas P.: *See—*
Long, John G.; and Watts, Nicholas P., 4,132,478, Cl. 355-71.000.

Weaver, R. Homer. Rotary engine. 4,132,213, Cl. 123-236.000.

Weber, Gunter, to Neiman S.A. Key cutting apparatus. 4,132,151, Cl. 90-13.050.

Weber, Kurt; and Brehm, Michael, to Carl Freudenberg, Firma. Rinsing multi component foam machines. 4,132,754, Cl. 264-39.000.

Wege, Regina: *See—*
Weisbach, Gunter; and Wege, Regina, 4,132,403, Cl. 271-277.000.

Wegner, John F.; and Heyek, Walter, to Edanbob Corporation. Power operated copyholder. 4,132,019, Cl. 40-349.000.

Weidemann, Karl H.: *See—*
Glucksman, Dov Z.; and Weidemann, Karl H., 4,132,885, Cl. 219-345.000.

Weidner, Hans: *See—*
Bianchi, Valerio; Metcher, Siegfried; Latsch, Reinhard; Weidner, Hans; and Brettschneider, Johannes, 4,132,195, Cl. 123-32.0EA.

Weinstein, Louis: *See—*
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Weisbach, Gunter; and Wege, Regina, to Veb Polygraph Leipzig Kombinat fuer Polygraphische Maschinen und Ausruestungen. Sheet transfer apparatus for printing machine. 4,132,403, Cl. 271-277.000.

Weischedel, Richard C.; and Carp, Gerald, to General Electric Company. Waveshape detector. 4,132,947, Cl. 324-77.00A.

Weiss, Folker H.: *See—*
Miller, Henry F.; Borts, Abraham; and Weiss, Folker H., 4,132,648, Cl. 210-242.00R.

Weiss, Gerhard, to BBC Brown, Boveri & Company Limited. Feedback control method for controlling the starting of a steam turbine plant. 4,132,076, Cl. 60-646.000.

Weiss, Helmut; Kraft, Harald; and Igel, Wolfgang, to Zinser Textilmaschinen GmbH. Process and apparatus for pneumatic separation and aspiration of broken thread ends. 4,132,057, Cl. 57-261.000.

Weldle, Helmut, to Heckler & Koch GmbH. Self-loading pistol. 4,132,023, Cl. 42-7.000.

Weller, Michael A.: *See*—
Weller, Stanley T.; Weller, Peter K.; and Weller, Michael A., 4,132,497, Cl. 408-241.00G.
Weller, Peter K.: *See*—
Weller, Stanley T.; Weller, Peter K.; and Weller, Michael A., 4,132,497, Cl. 408-241.00G.
Weller, Stanley T.; Weller, Peter K.; and Weller, Michael A. Drilling machines and guards therefor. 4,132,497, Cl. 408-241.00G.
Wendel, Ion L., to Lowe, James L. Paving and solar energy system and method. 4,132,074, Cl. 60-641.000.
Wenzler, Carl J.: *See*—
Rom, Frank E.; and Wenzler, Carl J., 4,132,217, Cl. 126-270.000.
Wesley, Michael A.: *See*—
Wang, Sherman S.; Wesley, Michael A.; and Will, Peter M., 4,132,318, Cl. 214-1.0BB.
Wessler, Louis E.; and Koch, Kenneth F., to Xerox Corporation. Video data detect circuits for video hard copy controller. 4,133,007, Cl. 358-280.000.
Western Chemical Company: *See*—
Rivers, Jacob B., Jr.; and Budke, Harry T., Jr., 4,132,535, Cl. 55-23.000.
Westinghouse Electric Corp.: *See*—
Adams, Maurice L., Jr., 4,132,416, Cl. 277-18.000.
Buzzelli, Edward S.; and Folser, George R., 4,132,547, Cl. 75-211.000.
Eichenlaub, Dennis P., 4,133,039, Cl. 364-554.000.
Kemeny, George A.; and Cookson, Alan H., 4,132,854, Cl. 174-27.000.
Lang, Walter W., 4,132,968, Cl. 335-16.000.
Miller, Howard N.; and Segar, William R., 4,132,175, Cl. 104-130.000.
Newton, Ralph E.; and Nixon, Henry M., 4,132,922, Cl. 315-73.000.
Overman, Kelly C.; and Calder, Thelma L., 4,133,037, Cl. 364-484.000.
Shah, Chandra C.; and Laurelli, James A., 4,132,114, Cl. 73-343.00R.
Wagenaar, Loren B., 4,132,853, Cl. 174-12.0BH.
Wright, Terry, 4,132,912, Cl. 310-62.000.
Westland Aircraft Limited: *See*—
Schorr, Murray A., 4,132,377, Cl. 244-137.00R.
Westvaco Corporation: *See*—
Damico, George L., 4,132,834, Cl. 428-511.000.
Shaylor, Harold H., 4,132,309, Cl. 206-278.000.
Wetzel, Gunter, to AGFA-GEVAERT AG. Electro-photographic copier with anti-spill arrangement. 4,132,476, Cl. 355-3.0DD.
Weyer, Rudi: *See*—
Hitzel, Volker; Weyer, Rudi; Pfaff, Werner; and Geisen, Karl, 4,132,795, Cl. 424-266.000.
Weyers, Jacobus R. M. G.; and Burm, Gabriel A. M., to Oce-van der Grinten N.V. Magnetic brush developing apparatus. 4,132,192, Cl. 118-658.000.
Whattam, George F., to Hynson, Westcott & Dunning, Inc. Micro blood collector. 4,132,225, Cl. 1 28-2.00F.
Wheatland Tube Company: *See*—
Saloom, Joseph T., 4,132,012, Cl. 34-105.000.
Wherry, Joseph L., to Toledo Stamping & Manufacturing Company. Rocker arm. 4,132,196, Cl. 123-90.390.
Whirlpool Corporation: *See*—
Deschaaf, Clifford L., 4,132,008, Cl. 34-45.000.
White, Allen A., to Hesston Corporation. Baler loading method. 4,132,163, Cl. 100-42.000.
White, Allen A., to Hesston Corporation. Baler loading method and apparatus. 4,132,164, Cl. 100-189.000.
White, Charles E.: *See*—
Scarola, Leonard S.; and White, Charles E., 4,132,857, Cl. 174-107.000.
White, Raymond V., to Rockwell International Corporation. Self-powered system for measuring and storing consumption of utility meter. 4,132,981, Cl. 340-203.000.
White, William A.: *See*—
Eadie, Brian K. M.; Craighead, James W.; McKerrell, Alistair A.; Wilson, Robert; and White, William A., 4,132,058, Cl. 57-125.000.
Whitsitt, Steven L.: *See*—
Sousek, Eugene A.; Stroemer, John R.; and Whitsitt, Steven L., 4,132,941, Cl. 318-663.000.
Wibell, Joan. Heating and cooling blanket. 4,132,262, Cl. 165-26.000.
Wiebe, Donald, to A. Stucki Company. Hydraulically dampened railway truck bolster. 4,132,176, Cl. 105-197.0DH.
Wilcox, Milton E., to National Semiconductor Corporation. Nonlinearity correction in wide range voltage controlled oscillators. 4,132,964, Cl. 331-116.00R.
Wilfert, Thomas; Grassle, Alfred; and Peters, Klaus-Jurgen, to Robert Bosch GmbH. Fuel injection system. 4,132,211, Cl. 123-179.00L.
Wilkerson, Joseph B.: *See*—
Reader, Kenneth R.; and Wilkerson, Joseph B., 4,132,500, Cl. 416-20.00R.
Will, Peter M.: *See*—
Wang, Sherman S.; Wesley, Michael A.; and Will, Peter M., 4,132,318, Cl. 214-1.0BB.
Willetts, Elwood H. Multiple axle suspension system. 4,132,433, Cl. 280-712.000.
Williams, Clark R., to Texas Instruments Incorporated. Stacked logic design for I^2L watch. 4,132,059, Cl. 58-23.00A.
Williams, Leonard E., Jr., to Cameron Iron Works, Inc. Pipe shearing ram assembly for blowout preventer. 4,132,265, Cl. 166-55.000.
Williams, Thomas A.: *See*—
Edwards, Robert H.; and Williams, Thomas A., 4,132,540, Cl. 71-34.000.
Willis, Chester R.: *See*—
Lamberti, Vincent; and Willis, Chester R., 4,132,735, Cl. 562-582.000.
Willis, Wilfred E., to Kaiser Cement & Gypsum Corporation. Accelerator for gypsum slurry. 4,132,565, Cl. 106-315.000.
Wilmeth, Claude H., to N-S-W Corporation. Power wrench for turning threaded connection members. 4,132,136, Cl. 81-57.390.
Wilms, Manfred W., to Joslyn Mfg. and Supply Co. Spark gap protector. 4,132,915, Cl. 313-325.000.
Wilson, Kenneth L., to Ken Wilson Departures, Inc. Steerable wheeled vehicle. 4,132,435, Cl. 280-772.000.
Wilson, Raymond L. Leg stretching exercise device. 4,132,404, Cl. 272-109.000.
Wilson, Robert: *See*—
Eadie, Brian K. M.; Craighead, James W.; McKerrell, Alistair A.; Wilson, Robert; and White, William A., 4,132,058, Cl. 57-125.000.
Wilson, Robert J.: *See*—
Johnson, Lauren L.; and Wilson, Robert J., 4,133,017, Cl. 361-42.000.
Winkler, Alexander, to Bruck Industries, Inc. Method of making carpet seaming tape. 4,132,582, Cl. 156-209.000.
Winkley, Jerry H., to ACF Industries, Inc. Choke valve closing means. 4,132,751, Cl. 261-39.00B.
Winter & Ibe: *See*—
Ibe, Wolfgang, 4,132,227, Cl. 128-4.000.
Wintermantel, Erich. Process for producing hollow profiled structures, and structures produced thereby. 4,132,577, Cl. 156-156.000.
Wise, Henry; and Wood, Bernard, to American Gas Association. Methanation catalyst. 4,132,672, Cl. 252-466.00B.
Wismer, Marco; and De Majistre, Robert, to PPG Industries, Inc. Laminates containing polyester resin finishes. 4,132,822, Cl. 428-196.000.
Witte, Arnold C., Jr.: *See*—
Coleman, Richard L.; Witte, Arnold C., Jr.; and Stone, Aubrey L., 4,132,658, Cl. 252-37.700.
Wittmaack, Klaus, to Gesellschaft fur Strahlen- und Umweltforschung mbH Munchen. Raster scanning ion microscope with quadrupole mass filter. 4,132,892, Cl. 250-309.000.
Wocher, Berthold; Pfendler, Thomas; and Pfitzemaier, Heinz, to Robert Bosch GmbH. Method and apparatus utilizing time-expanded pulse sequences for distance measurement in a radar. 4,132,991, Cl. 343-13.00R.
Woessner, Warren D.: *See*—
Kluender, Harold C.; Woessner, Warren D.; and Biddlecom, William G., 4,132,738, Cl. 260-586.00R.
Wolf, George: *See*—
Plotkin, George M.; and Wolf, George, 4,132,600, Cl. 195-103.50R.
Wolfrum, Gerhard: *See*—
Hugl, Herbert; and Wolfrum, Gerhard, 4,132,840, Cl. 521-167.000.
Wong, Stewart, to McNeil Laboratories, Inc. Antiarthritic potentiation. 4,132,788, Cl. 424-232.000.
Wood, Bernard: *See*—
Wise, Henry; and Wood, Bernard, 4,132,672, Cl. 252-466.00B.
Wood, Charles P., Jr. Reflected sign. 4,132,022, Cl. 40-591.000.
Woodfill, Michael W.: *See*—
Burrus, Billy S.; and Woodfill, Michael W., 4,132,453, Cl. 308-238.000.
Woods, Rosalind G. Collapsible stroller. 4,132,429, Cl. 280-647.000.
Woodward Governor Company: *See*—
Leeson, Plato J., 4,132,165, Cl. 102-49.800.
Woody, Robert E.: *See*—
Cournoyer, George R.; Woody, Robert E.; and Baker, John R., 4,132,320, Cl. 214-6.00H.
Worrell, Milton H. Cable holder and dispenser. 4,132,372, Cl. 242-129.620.
Wright, Terry, to Westinghouse Electric Corp. Quiet cooling system for dynamoelectric machines. 4,132,912, Cl. 310-62.000.
Wu, Joanna: *See*—
Haber, George J.; Tan, Chee T.; and Wu, Joanna, 4,132,793, Cl. 426-250.000.
Wu, Wen-li: *See*—
Smith, Andrew I.; and Wu, Wen-li, 4,132,757, Cl. 264-210.00F.
Wu, Yao H.; and Lobeck, Walter G., Jr., to Mead Johnson & Company. 10-Imidoylacridan compositions. 4,132,794, Cl. 424-257.000.
Wuchner, Xaver: *See*—
Baumann, Gerhard; Tanner, Hans; and Wuchner, Xaver, 4,132,495, Cl. 408-74.000.
Wunder, Friedrich: *See*—
Fernholz, Hans; Schmidt, Hans-Joachim; and Wunder, Friedrich, 4,132,733, Cl. 562-601.000.
Wurzburg, Henry, to Motorola, Inc. Pulse width modulator symmetry correction circuit and method thereof. 4,133,025, Cl. 363-41.000.
Wydeven, Theodore: *See*—
United States of America, National Aeronautics and Space Administration; Hudis, Martin; and Wydeven, Theodore, 4,132,829, Cl. 428-411.000.
Wynne, Kenneth J.; and Davison, John B., to United States of America, Navy. Silicon-phthalocyanine-siloxane polymers. 4,132,842, Cl. 528-33.000.
Xerox Corporation: *See*—
Gauronski, John F.; and Havel, Thomas A., 4,132,401, Cl. 271-245.000.

Naramore, Raymond, 4,132,400, Cl. 271-221.000.
Streifer, William; Scifres, Donald R.; and Burnham, Robert D., 4,132,960, Cl. 331-94.50H.
Wessler, Louis E.; and Koch, Kenneth F., 4,133,007, Cl. 358-280.000.

Yahata, Tsuyoshi: *See*—
Izawa, Shinichi; Ohzeki, Jurou; Yahata, Tsuyoshi; and Nakanishi, Atsuo, 4,132,684, Cl. 260-4.0AR.

Yamada, Hirofumi; Takaki, Noboru; and Masuda, Michio, to Kubota, Ltd. Method of producing inorganic boards. 4,132,590, Cl. 162-145.000.

Yamada, Kunimitsu: *See*—
Ikeda, Isamu; and Yamada, Kunimitsu, 4,132,498, Cl. 61-39.000.

Yamaguchi, Hisashi; Murase, Kenji; Ishizaki, Hiroyuki; and Kashiwara, Hirofumi, to Fujitsu Limited. System for driving a gas discharge panel. 4,132,924, Cl. 340-779.000.

Yamaguchi, Nobutaka: *See*—
Mukaida, Yoshito; Fujiyama, Masaaki; Komine, Shigeo; Igarashi, Masaaki; Yamaguchi, Nobutaka; Iida, Shinobu; and Kasuga, Akira, 4,132,827, Cl. 428-329.000.

Yamaguchi, Shigeto, to Riken Keiki Kabushiki Kaisha. Process for the production of a catalyst. 4,132,673, Cl. 252-466.0PT.

Yamamoto, Mitsuo, to Ishikawa Tekko Kabushiki Kaisha. Device for detecting the overdischarge of battery. 4,132,942, Cl. 320-13.000.

Yamamoto, Youshun: *See*—
Nakamura, Shoji; Nakamoto, Yasuyuki; Yamamoto, Youshun; Matsufuji, Akira; Haji, Takashi; and Nakama, Akihiro, 4,132,393, Cl. 266-117.000.

Yamane, Michiyoshi: *See*—
Asano, Masaharu; Aono, Shigeo; Hosaka, Akio; Ochiai, Kokichi; and Yamane, Michiyoshi, 4,132,200, Cl. 123-119.0EC.

Yamanoi, Koji: *See*—
Nakayama, Kenji; and Yamanoi, Koji, 4,132,202, Cl. 123-139.0AP.

Yamashita, Seiji. Vertical meat chopper. 4,131,972, Cl. 17-23.000.

Yamashita, Shigeru: *See*—
Kobayakawa, Masaki; Yawata, Kazufumi; Hirano, Kiyoshige; and Yamashita, Shigeru, 4,132,920, Cl. 313-497.000.

Yang, David C., to Michigan Technological University. Beneficiation of iron ores by froth flotation. 4,132,635, Cl. 209-166.000.

Yang, Kei-Hsiung; and DeLuca, John A., to General Electric Company. Tunable laser system. 4,132,962, Cl. 331-94.50F.

Yanik, Boris S.: *See*—
Khutoretsky, Garri M.; Vorontsov, Alexandr I.; Drozdova, Larisa A.; and Yanik, Boris S., 4,132,914, Cl. 310-184.000.

Yano, Yoshiro: *See*—
Takamiya, Takehisa; Yano, Yoshiro; and Nakamura, Yuji, 4,133,012, Cl. 360-90.000.

Yasui, Kazuomi: *See*—
Aya, Masahiro; Saito, Junichi; Kume, Toyohiko; and Yasui, Kazuomi, 4,132,542, Cl. 71-86.000.

Yates, Paul C., to Du Pont de Nemours, E. I., and Company. Recovery of fluoride values. 4,132,765, Cl. 423-484.000.

Yawata, Kazufumi: *See*—
Kobayakawa, Masaki; Yawata, Kazufumi; Hirano, Kiyoshige; and Yamashita, Shigeru, 4,132,920, Cl. 313-497.000.

Yokoyama, Toshiro: *See*—
Ueshima, Takashi; Yokoyama, Toshiro; and Kobayashi, Shoichi, 4,132,750, Cl. 260-887.000.

Yokoyama, Yasukazu; and Iwamoto, Eiji, to Toyo Soda Manufacturing Co., Ltd. Process for producing quinazolone derivatives. 4,132,851, Cl. 544-245.000.

Yokozawa, Norio: *See*—
Maio, Kenji; Inose, Fumiyuki; Yokozawa, Norio; Fujimoto, Ryoichi; and Takasugi, Kazuo, 4,132,085, Cl. 62-155.000.

Yoshino Kogyosho Co., Ltd.: *See*—
Nozawa, Takamitsu, 4,132,359, Cl. 239-333.000.

Yoshioka, Yoshio: *See*—
Sato, Minoru; Takahashi, Isao; Kurasawa, Takanao; Yoshioka, Yoshio; and Nakagawa, Yukio, 4,132,876, Cl. 200-148.00A.

Yoshizawa, Shigeru: *See*—
Hiroshima, Minoru; Yoshizawa, Shigeru; Saito, Nobuo; Asano, Atsushi; Suehiro, Hiroshi; Saitoh, Minoru; and Mise, Keisuke, 4,133,043, Cl. 365-15.000.

Young, Bruce, to BMR Security Products Corp. Security rack for weapons. 4,132,315, Cl. 211-4.000.

Young, John M.: *See*—
Greenwood, John C.; and Young, John M., 4,131,985, Cl. 29-580.000.

Young, Roger N., to Imperial Chemical Industries Limited. Polyolefin films. 4,132,050, Cl. 53-463.000.

Yu, Albert P.; and Myers, Edward C., to Standard Oil Company (Indiana). Selective hydrodesulfurization of cracked naphtha. 4,132,632, Cl. 208-216.000.

Yukawa, Hideki, to Kokusan Denki Co., Ltd. Ignition system for an internal combustion engine. 4,132,208, Cl. 123-148.0CC.

Yule, Thomas J., to United States of America, Energy. Monitor of the concentration of particles of dense radioactive materials in a stream of air. 4,132,894, Cl. 250-435.000.

Zabler, Erich, to Robert Bosch GmbH. High-sensitivity inductive transducer for rectilinear or rotational displacement. 4,132,980, Cl. 340-195.000.

Zabonick, Jerry L., to Evans Products Company. Fluid actuatable fan clutch with internal caliper action. 4,132,301, Cl. 192-85.0AA.

Zamozdik, Talivaldis V.: *See*—
Rode, Oyars A.; Lusis, Andrei R.; Klyavin, Yanis K.; and Zamozdik, Talivaldis V., 4,132,465, Cl. 350-357.000.

Zasio, John J.: *See*—
Buelow, Fred K.; Zasio, John J.; and Cooke, Laurence H., 4,132,898, Cl. 250-492.00A.

Zeeb, Helmut E., to Hewlett-Packard GmbH. Method for linearizing the characteristic curve of an electronic component and an apparatus for implementing the same. 4,132,116, Cl. 73-362.0AR.

Zenda, Richard J.: *See*—
Malacheski, Joseph J.; and Zenda, Richard J., 4,132,027, Cl. 43-134.000.

Zenith Radio Corporation: *See*—
Bratschun, William R., 4,132,341, Cl. 228-122.000.
Lerner, Martin L., 4,132,459, Cl. 316-18.000.

Zeyher, Fritz: *See*—
Meistring, Rolf; Rudolf, Karl; Schmid, Werner; and Zeyher, Fritz, 4,132,148, Cl. 89-1.701.

Ziegenfus, Barry L.; and Scheel, Russell H., to S I Handling Systems, Inc. Driverless vehicle shuttle. 4,132,174, Cl. 104-48.000.

Zielinski, Laura B.: *See*—
Schaible, Paul M.; Schwartz, Geraldine C.; and Zielinski, Laura B., 4,132,586, Cl. 156-643.000.

Ziger, S.A.: *See*—
Amuchastegui, Francisco, 4,132,173, Cl. 102-44.000.

Zinnbauer, Frederick W. Method of making a tank. 4,131,980, Cl. 29-463.000.

Zinnes, Harold; and Lindo, Neil A., to Warner-Lambert. Bis(2-[(disubstituted amino)methyl]-1H-indole) compounds. 4,132,792, Cl. 424-250.000.

Zinser Textilmaschinen GmbH: *See*—
Weiss, Helmut; Kraft, Harald; and Igel, Wolfgang, 4,132,057, Cl. 57-261.000.

Zocher, Josef, to Singer Company, The. Felting needle. 4,131,978, Cl. 28-115.000.

Zuckert, Bertram: *See*—
Behmel, Klaus; Schmut, Wolfgang; and Zuckert, Bertram, 4,132,687, Cl. 260-22.00A.

Zundel, Arthur P., to National Can Corporation. Panel with opening means. 4,132,328, Cl. 220-267.000.

Zwaanswijk, Michel L.: *See*—
van der Lende, Leendert J.; and Zwaanswijk, Michel L., 4,132,279, Cl. 180-9.500.

Zwitserloot, Wilhelmus R. M.: *See*—
Verberne, Petrus; Zwitserloot, Wilhelmus R. M.; and Nauta, Robijn R., 4,132,566, Cl. 127-65.000.

LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 2ND DAY OF JANUARY, 1979

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Alcan Aluminum Corporation: *See—*
Funck, Dennis L., T978,005, Cl. 264-85.000.

Carman, Richard W.; Riggs, Kenneth E.; Seward, Percy R.; and Smith, Thomas R. Spring projected bolt latching device. T978,006, 1-2-79, Cl. 292-41.000.

Funck, Dennis L., to Alcan Aluminum Corporation. Process for extruding polyethylene. T978,005, 1-2-79, Cl. 264-85.000.

Gibson, William G. Use of chelating agents in the conversion of coal to low-mineral content fuel. T978,004, 1-2-79, Cl. 208-8.000.

Kameoka, Kimitaka: *See—*
Yoneyama, Masakazu; Mukunoki, Yasuo; Yamaguchi, June; Kameoka, Kimitaka; and Oka, Yutaka, T978,001, Cl. 96-114.500.

Livesay, Richard E. Track link- T-shaped. T978,007, 1-2-79, Cl. 305-39.000.

Messenger, Joseph U. Technique for cementing casing in deviated boreholes. T978,002, 1-2-79, Cl. 166-311.000.

Mukunoki, Yasuo: *See—*
Yoneyama, Masakazu; Mukunoki, Yasuo; Yamaguchi, June; Kameoka, Kimitaka; and Oka, Yutaka, T978,001, Cl. 96-114.500.

Oka, Yutaka: *See—*
Yoneyama, Masakazu; Mukunoki, Yasuo; Yamaguchi, June; Kameoka, Kimitaka; and Oka, Yutaka, T978,001, Cl. 96-114.500.

Riggs, Kenneth E.: *See—*
Carman, Richard W.; Riggs, Kenneth E.; Seward, Percy R.; and Smith, Thomas R., T978,006, Cl. 292-41.000.

Seward, Percy R.: *See—*
Carman, Richard W.; Riggs, Kenneth E.; Seward, Percy R.; and Smith, Thomas R., T978,006, Cl. 292-41.000.

Smith, Thomas R.: *See—*
Carman, Richard W.; Riggs, Kenneth E.; Seward, Percy R.; and Smith, Thomas R., T978,006, Cl. 292-41.000.

Wu, Tai-Wing; and Yau, Shirley S. Reduction of ascorbic acid interference in assays of aqueous fluids. T978,003, 1-2-79, Cl. 195-63.000.

Yamaguchi, June: *See—*
Yoneyama, Masakazu; Mukunoki, Yasuo; Yamaguchi, June; Kameoka, Kimitaka; and Oka, Yutaka, T978,001, Cl. 96-114.500.

Yau, Shirley S.: *See—*
Wu, Tai-Wing; and Yau, Shirley S., T978,003, Cl. 195-63.000.

Yoneyama, Masakazu; Mukunoki, Yasuo; Yamaguchi, June; Kameoka, Kimitaka; and Oka, Yutaka. Silver halide photographic photosensitive material. T978,001, 1-2-79, Cl. 96-114.500.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 2ND DAY OF JANUARY, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Becker, Otto A. Electroplating of the cut edges of sheet metal panels. Re. 29,874, Cl. 204-15.000.

Bryan, Hugh D.: *See—*
Mercer, Neil H.; and Bryan, Hugh D., Re. 29,875, Cl. 424-253.000.

Cunningham, Ernest R., to Grip-Pak Systems, Inc. Scrapless plastic sheet multi-packaging device. Re. 29,873, Cl. 206-150.000.

Eaton Corporation: *See—*
Goscenski, Edward J., Jr., Re. 29,872, Cl. 74-711.000.

Goscenski, Edward J., Jr., to Eaton Corporation. Differential gear mechanism. Re. 29,872, Cl. 74-711.000.

Grip-Pak Systems, Inc.: *See—*
Cunningham, Ernest R., Re. 29,873, Cl. 206-150.000.

Mead Johnson & Company: *See—*
Mercer, Neil H.; and Bryan, Hugh D., Re. 29,875, Cl. 424-253.000.

Mercer, Neil H.; and Bryan, Hugh D., to Mead Johnson & Company. Bronchodilator expectorant elixir. Re. 29,875, Cl. 424-253.000.

Reese, Stanton L. Container for transporting radioactive materials. Re. 29,876, Cl. 250-506.000.

LIST OF PLANT PATENTEES

Ryan, John J. Impatiens plant. 4,363, 1-2-79, Cl. 68.000.

Ryan, John J. Impatiens plant Shawnee. 4,364, 1-2-79, Cl. 68.000.

Williams, J. Benjamin. Rose plant. 4,360, 1-2-79, Cl. 7.000.

Williams, J. Benjamin. Rose plant. 4,361, 1-2-79, Cl. 20.000.

Zaiger, C. Floyd. Nectarine tree. 4,362, 1-2-79, Cl. 41.000.

LIST OF DESIGN PATENTEES

A-T-O Inc.: *See—*
DeHaan, Wolbert, 250,706, Cl. D13-5.000.

Aberizk, Philip G.: *See—*
Vetere, John J.; Edin, Ronald E.; and Aberizk, Philip G., 250,683, Cl. D6-136.000.

Amba Marketing Systems, Inc.: *See—*
Siegel, Milton I., 250,734, Cl. D87-3.00F.

Appleman, Donald T., to Procter & Gamble Company, The. Nonwoven sheet material or the like. 250,733, 1-2-79, Cl. D59-2.00B.

Ashcraft, Frederick N. Reversible holder for plant pots, vases or the like. 250,686, 1-2-79, Cl. D6-183.000.

Barr, Josef J. Pendant or similar article. 250,699, 1-2-79, Cl. D11-56.000.

Bond, Curtis J.; and Ulm, John G., to Corco, Inc. Adapter for a container spout. 250,692, 1-2-79, Cl. D9-253.000.

Breneman, Jack L., to Quaker Oats Company, The. Toy bulldozer. 250,725, 1-2-79, Cl. D34-15.0AM.
Cartier International B.V.: *See—*
Perrin, Alain D., 250,693, Cl. D10-39.000.
Perrin, Alain D., 250,694, Cl. D10-39.000.
Perrin, Alain D., 250,695, Cl. D10-39.000.
Perrin, Alain D., 250,698, Cl. D10-131.000.
Castiglioni, Achille. Light fixture. 250,731, 1-2-79, Cl. D48-20.00A.
Child Guidance Playthings, Inc.: *See—*
Satten, Michael I., 250,728, Cl. D34-15.0JJ.
Church's Fried Chicken, Inc.: *See—*
Fraley, D. Pat, 250,720, Cl. D25-25.000.
Fraley, D. Pat, 250,721, Cl. D25-25.000.
Cooper Thermometer Company, The: *See—*
Kaniwec, George N., 250,696, Cl. D10-58.000.
Coratomic, Inc.: *See—*
Jacobson, Peter; and Norman, Robert, 250,719, Cl. D24-17.000.
Corco, Inc.: *See—*
Bond, Curtis J.; and Ulm, John G., 250,692, Cl. D9-253.000.
Cousins, Michael A.: *See—*
Cousins, Morison S.; and Cousins, Michael A., 250,722, Cl. D28-16.000.
Cousins, Morison S.; and Cousins, Michael A., to Gillette Company, The. Portable hair dryer. 250,722, 1-2-79, Cl. D28-16.000.
Craven, Charles G. Tennis racquet holder. 250,682, 1-2-79, Cl. D6-125.000.
Creative Playgrounds Corporation: *See—*
Dieter, Berthold B.; and Gibson, Charles L., 250,723, Cl. D34-5.00E.
Dieter, Berthold B.; and Gibson, Charles L., 250,724, Cl. D34-5.00L.
DeHaan, Wolbert, to A-T-O Inc. Battery charger. 250,706, 1-2-79, Cl. D13-5.000.
Dictaphone Corporation: *See—*
Pulos, Arthur J.; and Sweeney, Paul B., 250,707, Cl. D14-1.000.
Dieter, Berthold B.; and Gibson, Charles L., to Creative Playgrounds Corporation. Playground slide. 250,723, 1-2-79, Cl. D34-5.00E.
Dieter, Berthold B.; and Gibson, Charles L., to Creative Playgrounds Corporation. Playground unit. 250,724, 1-2-79, Cl. D34-5.00L.
Doi, Sinichiro; and Sekido, Iwae, to Toyota Jidosha Kogyo Kabushiki Kaisha. Wheel. 250,705, 1-2-79, Cl. D12-211.000.
Donnelly Mirrors, Inc.: *See—*
VandenBrink, Wayne; and Stegenga, Philip D., 250,702, Cl. D12-187.000.
Edin, Ronald E.: *See—*
Vetere, John J.; Edin, Ronald E.; and Aberizk, Philip G., 250,683, Cl. D6-136.000.
Ernest, Robert O.: *See—*
Lee, Ernest; and Ernest, Robert O., 250,689, Cl. D7-94.000.
Felske, Arthur M.; and Hauenstein, Max C., to General Electric Company. Electric coffeemaker or similar article. 250,688, 1-2-79, Cl. D7-41.000.
Felske, Arthur M., to General Electric Company. Stand for a ground coffee dispenser. 250,690, 1-2-79, Cl. D7-130.000.
Fraley, D. Pat, to Church's Fried Chicken, Inc. Fast service restaurant building. 250,720, 1-2-79, Cl. D25-25.000.
Fraley, D. Pat, to Church's Fried Chicken, Inc. Fast service restaurant building. 250,721, 1-2-79, Cl. D25-25.000.
Gageby, Steven D. Chair. 250,679, 1-2-79, Cl. D6-67.000.
Gageby, Steven D. Chair. 250,680, 1-2-79, Cl. D6-75.000.
General Electric Company: *See—*
Felske, Arthur M.; and Hauenstein, Max C., 250,688, Cl. D7-41.000.
Felske, Arthur M., 250,690, Cl. D7-130.000.
General Mills Fun Group, Inc.: *See—*
Venditti, Arthur P., 250,726, Cl. D34-15.0HH.
Venditti, Arthur P., 250,727, Cl. D34-15.0HH.
Gibson, Charles L.: *See—*
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Gillette Company, The: *See—*
Cousins, Morison S.; and Cousins, Michael A., 250,722, Cl. D28-16.000.
Goldschmidt, Willfred, to Norlin Music, Inc. Carrying case for a musical instrument or similar article. 250,732, 1-2-79, Cl. D87-5.00F.
GTE Sylvania Incorporated: *See—*
Vetere, John J.; Edin, Ronald E.; and Aberizk, Philip G., 250,683, Cl. D6-136.000.
Hall, Peter J. Microfiche reader. 250,678, 1-2-79, Cl. D16-14.000.
Hauenstein, Max C.: *See—*
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Hedstrom, Norman; Wright, David M.; and O'Toole, Jerome, to Wright Line Inc. Document holder. 250,715, 1-2-79, Cl. D19-91.000.
Horpestad, Melvin V. Garbage container. 250,691, 1-2-79, Cl. D7-189.000.
Ina, Shiro: *See—*
Taitani, Hirotsune; and Ina, Shiro, 250,703, Cl. D12-209.000.
Insalaco, Charles J. Plant stand. 250,685, 1-2-79, Cl. D6-146.000.
Jacobson, Peter; and Norman, Robert, to Coratomic, Inc. Heart pacer. 250,719, 1-2-79, Cl. D24-17.000.
Jonnum, Orlando A. Expanded metal panel. 250,735, 1-2-79, Cl. D92-26.000.
Jordan, Bernard A. Tire tread gauge. 250,697, 1-2-79, Cl. D10-70.000.
Kaniwec, George N., to Cooper Thermometer Company, The. Thermometer. 250,696, 1-2-79, Cl. D10-58.000.
Konski, Jose. Combined lamp and picture frame. 250,729, 1-2-79, Cl. D48-20.00D.
Koppelomaki, Leo: *See—*
Persson, Per; and Koppelomaki, Leo, 250,711, Cl. D14-33.000.
Korpi, Jouko K. Ripper shield for construction and agricultural machinery. 250,713, 1-2-79, Cl. D15-28.000.
Koster, Milton G. Fireplace stove. 250,718, 1-2-79, Cl. D23-97.000.
Krupotich, Edward A., to Omation Corporation. Envelope power stacker. 250,701, 1-2-79, Cl. D12-58.000.
Lee, Ernest; and Ernest, Robert O., to Sunbeam Corporation. Corn popper. 250,689, 1-2-79, Cl. D7-94.000.
Love, Francis L. Paint brush. 250,677, 1-2-79, Cl. D4-38.000.
McKinsey, Edward P., Jr. Sport cap. 250,676, 1-2-79, Cl. D2-244.000.
Mistry, Sharad M. Combined hamper and shelving unit. 250,681, 1-2-79, Cl. D6-86.000.
Norlin Music, Inc.: *See—*
Goldschmidt, Willfred, 250,732, Cl. D87-5.00F.
Norman, Robert: *See—*
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Omation Corporation: *See—*
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O'Toole, Jerome: *See—*
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Perrin, Alain D., to Cartier International B.V. Watch. 250,693, 1-2-79, Cl. D10-39.000.
Perrin, Alain D., to Cartier International B.V. Watch. 250,694, 1-2-79, Cl. D10-39.000.
Perrin, Alain D., to Cartier International B.V. Watch. 250,695, 1-2-79, Cl. D10-39.000.
Perrin, Alain D., to Cartier International B.V. Watch crown. 250,698, 1-2-79, Cl. D10-131.000.
Persson, Per; and Koppelomaki, Leo. Loud-speaker device for cars. 250,711, 1-2-79, Cl. D14-33.000.
Procter & Gamble Company, The: *See—*
Appleman, Donald T., 250,733, Cl. D59-2.00B.
Pulos, Arthur J.; and Sweeney, Paul B., to Dictaphone Corporation. Console for central dictation system. 250,707, 1-2-79, Cl. D14-1.000.
Quaker Oats Company, The: *See—*
Breneman, Jack L., 250,725, Cl. D34-15.0AM.
Robelen, Jerome. Bed canopy. 250,687, 1-2-79, Cl. D6-198.000.
Rodriguez, Nicolas. Sink. 250,717, 1-2-79, Cl. D23-58.000.
Sakaguchi, Hiroshi, to Sharp Kabushiki Kaisha. Citizens band microphone. 250,708, 1-2-79, Cl. D14-12.000.
Sakaguchi, Hiroshi, to Sharp Kabushiki Kaisha. Citizens band microphone. 250,709, 1-2-79, Cl. D14-12.000.
Sanyo Electric Co., Ltd.: *See—*
Yasuoka, Junji, 250,710, Cl. D14-7.000.
Satten, Michael I., to Child Guidance Playthings, Inc. Toy boat. 250,728, 1-2-79, Cl. D34-15.0JJ.
Scarpa, Tobia. Light fixture. 250,730, 1-2-79, Cl. D48-20.00A.
Sekido, Iwae: *See—*
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Sakaguchi, Hiroshi, 250,708, Cl. D14-12.000.
Sakaguchi, Hiroshi, 250,709, Cl. D14-12.000.
Siegel, Milton I., to Amba Marketing Systems, Inc. Handbag. 250,734, 1-2-79, Cl. D87-3.00F.
Smith, Lee A. Shower stall for handicapped persons. 250,716, 1-2-79, Cl. D23-57.000.
Stegenga, Philip D.: *See—*
VandenBrink, Wayne; and Stegenga, Philip D., 250,702, Cl. D12-187.000.
Studdard, Marie W. Santa Claus stocking. 250,700, 1-2-79, Cl. D11-126.000.
Sunbeam Corporation: *See—*
Lee, Ernest; and Ernest, Robert O., 250,689, Cl. D7-94.000.
Sweeney, Paul B.: *See—*
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Taitani, Hirotsune; and Ina, Shiro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Wheel. 250,703, 1-2-79, Cl. D12-209.000.
Taitani, Hirotsune, to Toyota Jidosha Kogyo Kabushiki Kaisha. Wheel. 250,704, 1-2-79, Cl. D12-211.000.
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Doi, Sinichiro; and Sekido, Iwae, 250,705, Cl. D12-211.000.
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Ulm, John G.: *See—*
Bond, Curtis J.; and Ulm, John G., 250,692, Cl. D9-253.000.
VandenBrink, Wayne; and Stegenga, Philip D., to Donnelly Mirrors, Inc. Rearview mirror support bracket. 250,702, 1-2-79, Cl. D12-187.000.
van der Lely, Cornelis. Cultivator tine. 250,714, 1-2-79, Cl. D15-29.000.
Van Sant, Lorraine A. Table. 250,684, 1-2-79, Cl. D6-146.000.
Venditti, Arthur P., to General Mills Fun Group, Inc. Toy airplane. 250,726, 1-2-79, Cl. D34-15.0HH.
Venditti, Arthur P., to General Mills Fun Group, Inc. Toy airplane. 250,727, 1-2-79, Cl. D34-15.0HH.
Vetere, John J.; Edin, Ronald E.; and Aberizk, Philip G., to GTE Sylvania Incorporated. Electric burner stand. 250,683, 1-2-79, Cl. D6-136.000.
Wright, David M.: *See—*
Hedstrom, Norman; Wright, David M.; and O'Toole, Jerome, 250,715, Cl. D19-91.000.
Wright Line Inc.: *See—*
Hedstrom, Norman; Wright, David M.; and O'Toole, Jerome, 250,715, Cl. D19-91.000.
Yanitz, Lawrence L. Transceiver. 250,712, 1-2-79, Cl. D14-68.000.
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CLASSIFICATION OF PATENTS

ISSUED JANUARY 2, 1979

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

2 R 4,131,952
171.1 4,131,953
177 4,131,954
246 4,131,955

CLASS 3

1.91 4,131,956
4,131,957

CLASS 4

227 4,131,958
319 4,131,959

CLASS 5

37 R 4,131,960
247 4,131,961

CLASS 8

17 4,132,522
21 R 4,132,523
151 4,132,524
173 4,132,525

CLASS 9

6 P 4,131,962
310 AA 4,131,963
337 4,131,974

CLASS 10

162 R 4,131,964

CLASS 12

86.7 4,131,965

CLASS 13

32 4,132,852

CLASS 15

28 4,131,966
167 A 4,131,967

CLASS 16

129 4,131,968
137 4,131,969
147 4,131,970
150 4,131,971

CLASS 17

23 4,131,972
52 4,131,973

CLASS 23

230 A 4,132,529
4,132,530
230 B 4,132,527
4,132,528

CLASS 24

30.5 W 4,131,975
196 4,131,976

CLASS 26

91 4,131,977

CLASS 28

2 F 4,132,225
115 4,131,978

CLASS 29

2.19 4,131,979
463 4,131,980
505 4,131,981
566.2 4,131,982
571 4,131,983
572 4,131,984
580 4,131,985
592 R 4,131,986
593 4,131,987
596 4,131,988
4,131,989
598 4,131,990
622 4,131,991
4,131,992
768 4,131,993

CLASS 30

148 4,131,994
200 4,131,995
273 4,131,996
276 4,131,997

CLASS 33

1 C 4,131,998
23 R 4,131,999
174 B 4,132,000
178 D 4,132,001
180 R 4,132,002
182 4,132,003
366 4,132,004

CLASS 34

10 4,132,005
4,132,006
35 4,132,007
45 4,132,008
4,132,009
60 4,132,010
86 4,132,011
105 4,132,012
160 4,132,013

CLASS 35

13 4,132,014
31 F 4,132,015

CLASS 36

114 4,132,016

CLASS 37

141 R 4,132,017

CLASS 40

152.1 4,132,018
349 4,132,019
591 4,132,022
606 4,132,020
614 4,132,021

CLASS 42

7 4,132,023
71 P 4,132,024

CLASS 43

4 4,132,025
131 4,132,026
134 4,132,027

CLASS 44

63 4,132,531

CLASS 46

17 4,132,028
74 D 4,132,029
4,132,030
228 4,132,031
237 4,132,032

CLASS 48

174 4,132,532

CLASS 49

71 4,132,033
382 4,132,034
484 4,132,035

CLASS 51

124 L 4,132,036
131 C 4,132,037
204 4,132,038
295 4,132,533
307 4,132,534
424 4,132,039

CLASS 52

115 4,132,040
118 4,132,041
309.1 4,132,042
309.17 4,132,043
685 4,132,045
745 4,132,046
775 4,132,044

CLASS 53

75 4,132,052
137 4,132,053
396 4,132,047
434 4,132,048
452 4,132,049
4,132,051
463 4,132,050

CLASS 54

6 R 4,132,054
23 4,132,055

CLASS 55

4,132,535
97 4,132,536
226 4,132,537

CLASS 57

125 4,132,058
261 4,132,057
263 4,132,056

CLASS 58

23 A 4,132,059
23 R 4,132,060
59 4,132,061
90 R 4,132,062

CLASS 59

7 4,132,063

CLASS 60

39.02 4,132,065
39.14 4,132,064
39.65 4,132,066
204 4,132,067
226 A 4,132,068
226 R 4,132,069
290 4,132,070
328 4,132,071
443 4,132,072
562 4,132,073
641 4,132,074
4,132,075
646 4,132,076
649 4,132,077
682 4,132,078

CLASS 61

39 4,132,498

CLASS 62

155 4,132,085
209 4,132,086
285 4,132,087
298 4,132,088

CLASS 64

2 R 4,132,089
9 R 4,132,090

CLASS 65

32 4,132,538
40 4,132,539

CLASS 70

165 4,132,091
208 4,132,092
231 4,132,093

CLASS 71

34 4,132,540
76 4,132,541
86 4,132,542
88 4,132,543
118 4,132,544

CLASS 72

7 4,132,094
8 4,132,095
21 4,132,096
71 4,132,097
102 4,132,098
175 4,132,099
217 4,132,100
324 4,132,101
4,132,102
326 4,132,103
342 4,132,104
356 4,132,105
384 4,132,106
416 4,132,107
430 4,132,108

CLASS 73

23 4,132,109
32 A 4,132,110
46 4,132,111
141 R 4,132,112
178 R 4,132,113
343 R 4,132,114
349 4,132,115
362 AR 4,132,116
607 4,132,117

CLASS 74

44 4,132,118
217 B 4,132,119
230.17 A 4,132,120
4,132,121
339 4,132,122
473 R 4,132,124
473 SW 4,132,123
477 4,132,125
479 4,132,126
512 4,132,127
527 4,132,128
553 4,132,129
572 4,132,130
675 4,132,131
711 Re.29,872
732 4,132,132
745 4,132,133
801 4,132,134

CLASS 75

10 C 4,132,545
42 4,132,546
211 4,132,547

CLASS 81

3.46 A 4,132,135
57.39 4,132,136

CLASS 83

404 4,132,137
697 4,132,138

CLASS 84

1.03 4,132,139
1.11 4,132,140
115 4,132,141
4,132,142
314 4,132,143
359 4,132,144

CLASS 85

32 R 4,132,145
33 4,132,146

CLASS 89

1.5 G 4,132,147
1.701 4,132,148
1.704 4,132,149
1.806 4,132,150

CLASS 90

13.05 4,132,151

CLASS 91

364 4,132,152
405 4,132,153
491 4,132,154

CLASS 93

1 G 4,132,155
51.1 4,132,156
58.1 4,132,157

CLASS 96

1 TE 4,132,548
35 4,132,549
36 4,132,550
66.5 4,132,551
87 R 4,132,552
91 R 4,132,553

CLASS 98

2.18 4,132,158
42 R 4,132,159
4,132,160

CLASS 99

472 4,132,161
630 4,132,162

CLASS 100

42 4,132,163
189 4,132,164

CLASS 101

247 4,132,166
425 4,132,167
471 4,132,168

CLASS 102

6 4,132,169
4,132,170
28 R 4,132,171
30 4,132,172
44 4,132,173
49.8 4,132,165

CLASS 104

48 4,132,174
130 4,132,175

CLASS 105

197 DH 4,132,176
310 4,132,177

CLASS 106

55 4,132,554
90 4,132,555
4,132,556
100 4,132,557
104 4,132,558
117 4,132,559
288 B 4,132,560
308 M 4,132,561
4,132,562
4,132,563
4,132,564
315 4,132,565

CLASS 108

144 4,132,178

CLASS 110

211 4,132,179
244 4,132,180

CLASS 111

7 4,132,181

CLASS 112

79 R 4,132,182
262 4,132,183
4,132,184

CLASS 113

120 R 4,132,185

CLASS 116

216 4,132,186
225 4,132,187
332 4,132,188

CLASS 118

8 4,132,189
76 4,132,190
409 4,132,191
658 4,132,192

CLASS 123

32 EA 4,132,194
4,132,195
32 EE 4,132,193
75 B 4,132,197
90.39 4,132,196
119 EC 4,132,199
4,132,200
119 LR 4,132,198
139 AP 4,132,202
139 AW 4,132,203
4,132,204
139 BC 4,132,205
139 E 4,132,201
140 R 4,132,206
141 4,132,207
148 CC 4,132,208
169 R 4,132,209
179 L 4,132,210
4,132,211
191 S 4,132,212
236 4,132,213

CLASS 124

1 4,132,214
35 A 4,132,215

CLASS 126

261 4,132,216
270 4,132,217
4,132,218
4,132,219
271 4,132,220
4,132,221
4,132,222
4,132,223

CLASS 127

65 4,132,566

CLASS 128

2 S 4,132,224
2.1 R 4,132,226
4 4,132,227
33 4,132,228
134 4,132,229
4,132,230
218 A 4,132,231
360 4,132,232
419 PG 4,132,233

CLASS 132

73 4,132,234

CLASS 134

1 4,132,567
3 4,132,568
4,132,569
99 4,132,235

CLASS 135

16 4,132,236

CLASS 136

89 P 4,132,570

CLASS 137

15.1 4,132,240
75 4,132,237
102 4,132,241
172 4,132,238
263 4,132,242
268 4,132,243
344 4,132,244
377 4,132,245
382 4,132,239
536 4,132,246
806 4,132,247

CLASS 139

436 4,132,248
453 4,132,249

CLASS 140

115 4,132,250
147 4,132,251
4,132,252

CLASS 144

133 R 4,132,253
134 D 4,132,254
193 R 4,132,255
253 F 4,132,256

CLASS 148

1.5 4,132,571
6.15 R 4,132,572
175 4,132,573

CLASS 149

2 4,132,574

CLASS 150

52 R 4,132,257

CLASS 152

185 4,132,258

CLASS 156

58 4,132,575
143 4,132,576
156 4,132,577
158 4,132,578
189 4,132,579
193 4,132,580
208 4,132,581
209 4,132,582
351 4,132,583
500 4,132,584
626 4,132,585
643 4,132,586

CLASS 159

27 A 4,132,587
47 R 4,132,588

CLASS 162

65 4,132,589
145 4,132,590
146 4,132,591
216 4,132,592

CLASS 164

4 4,132,259
16 4,132,260
448 4,132,261

CLASS 165

26 4,132,262
48 R 4,132,263
179 4,132,264

CLASS 166

55 4,132,265
4,132,266
4,132,267
244 C 4,132,268
268 4,132,269
314 4,132,270

CLASS 169

62 4,132,271

CLASS 172

2 4,132,272
4,132,273
59 4,132,274
4,132,275

CLASS 173

1 4,132,276

CLASS 174

12 BH 4,132,853
27 4,132,854
28 4,132,855
52 PE 4,132,856
107 4,132,857
120 SR 4,132,858

CLASS 175

19 4,132,277

CLASS 179

1 GQ 4,132,859
1 P 4,132,861
15 AF 4,132,862
15 AQ 4,132,866
15 BS 4,132,867
16 F 4,132,863
18 E 4,132,868
18 FA 4,132,864
18 GF 4,132,865
38 4,132,869
81 R 4,132,870
84 VF 4,132,871
99 4,132,860
115.5 R 4,132,872

CLASS 180

6.48 4,132,278
9.5 4,132,279
19 H 4,132,280
33 C 4,132,281
65 DD 4,132,282
66 R 4,132,283
105 E 4,132,284

CLASS 181

258 4,132,285
265 4,132,286

CLASS 182

45 4,132,287
156 4,132,288

CLASS 184

15 R 4,132,289

CLASS 188

69 4,132,290
73.6 4,132,291
171 4,132,292
181 R 4,132,293
218 XL 4,132,294

CLASS 190

60 4,132,295

CLASS 192

4 R 4,132,296
36 4,132,297
53 B 4,132,298
58 B 4,132,299
82 T 4,132,300
85 AA 4,132,301
87.13 4,132,302

CLASS 194

4 F 4,132,303

CLASS 195

4,132,594
31 R 4,132,595
63 4,132,596
96 4,132,597
99 4,132,598
103.5 K 4,132,599
103.5 R 4,132,600

CLASS 198

432 4,132,304
4,132,305

CLASS 200

6 R 4,132,873
16 F 4,132,874
61.13 4,132,875
148 A 4,132,876
296 4,132,877

CLASS 203

9 4,132,601
4,132,602
4,132,603
87 4,132,604

CLASS 204

1 T 4,132,605
2.1 4,132,606
9 4,132,607
15 Re.29,874
27 4,132,608
28 4,132,609
43 S 4,132,610
59 R 4,132,611
192 EC 4,132,614
192 R 4,132,612
4,132,613
195 P 4,132,616
195 S 4,132,615
206 4,132,617
218 4,132,618
242 4,132,619
4,132,620
243 M 4,132,621
268 4,132,622
275 4,132,623
298 4,132,624
299 R 4,132,625
301 4,132,626

CLASS 206

37 4,132,306
115 4,132,307
150 Re.29,873
219 4,132,308
278 4,132,309
386 4,132,310
387 4,132,311
461 4,132,312

CLASS 208

10 4,132,627
108 4,132,628
113 4,132,629
177 4,132,630
216 4,132,632
236 4,132,631

CLASS 209

9 4,132,633
136 4,132,634
166 4,132,635
560 4,132,313
565 4,132,314

CLASS 210

6 4,132,636
7 4,132,637
4,132,638
51 4,132,639
68 4,132,640
73 R 4,132,641
75 4,132,642
84 4,132,643
85 4,132,644
104 4,132,645
114 4,132,646
230 4,132,647
242 R 4,132,648
347 4,132,649
491 4,132,650
522 4,132,651
536 4,132,652

CLASS 211

4 4,132,315
13 4,132,316

CLASS 212

49 4,132,317

CLASS 214

1 BB 4,132,318
4,132,319
6 DK 4,132,321
6 H 4,132,320
17 DB 4,132,322
85 4,132,323
138 R 4,132,324
515 4,132,325
4,132,326

CLASS 219

10.55 B 4,132,878
98 4,132,879
114 4,132,880
203 4,132,881
216 4,132,882
284 4,132,883
300 4,132,884
345 4,132,885
523 4,132,886

CLASS 220

244 4,132,327
267 4,132,328

CLASS 221

45 4,132,329

CLASS 222

76 4,132,330
107 4,132,331
387 4,132,332
402.13 4,132,333
490 4,132,334

CLASS 224

42.1 F 4,132,335
42.13 4,132,336

CLASS 225

5 4,132,337

CLASS 228

27 4,132,338
103 4,132,339
113 4,132,340
122 4,132,341
136 4,132,342
168 4,132,343

CLASS 229

2.5 R 4,132,344
8 4,132,345
28 R 4,132,346
62.5 4,132,347
75 4,132,348

CLASS 233

25 4,132,349

CLASS 235

92 FL 4,132,887
454 4,132,351
456 4,132,352
493 4,132,350

CLASS 236

10 4,132,353
11 4,132,354
47 4,132,355

CLASS 237

1 A 4,132,356

CLASS 239

11 4,132,357
204 4,132,358
333 4,132,359
383 4,132,360
417.5 4,132,361
453 4,132,362
455 4,132,363
542 4,132,364

CLASS 241

21 4,132,365
245 4,132,366

CLASS 242

47.01 4,132,368
47.1 4,132,367
47.12 4,132,370
47.5 4,132,369
58.3 4,132,371
129.62 4,132,372

CLASS 244

46 4,132,374
90 R 4,132,375
104 R 4,132,376
137 R 4,132,377
159 4,132,373
175 4,132,378

CLASS 246

167 R 4,132,379

CLASS 248

224.1 4,132,380
316 R 4,132,381

CLASS 250

204 4,132,888
213 VT 4,132,889
231 SE 4,132,890
239 4,132,891
272 4,132,653
309 4,132,892
315 A 4,132,893
320 4,132,654
435 4,132,894
445 T 4,132,895
4,132,896
468 4,132,897
491 4,132,900
492 A 4,132,898
506 Re.29,876
577 4,132,899

CLASS 251

5 4,132,382
29 4,132,383
129 4,132,384
147 4,132,385
171 4,132,386
175 4,132,388

CLASS 252

8.1 4,132,655
30 4,132,656
32.5 4,132,657
37.7 4,132,658
48.8 4,132,659
51.5 A 4,132,661
51.5 R 4,132,660
56 R 4,132,662
59 4,132,663
78.3 4,132,664
309 4,132,666
387 4,132,667
430 4,132,668
435 4,132,669
437 4,132,670
445 4,132,671
466 B 4,132,672
466 PT 4,132,673
500 4,132,674
522 4,132,675
4,132,676
4,132,677
545 4,132,678
4,132,679
547 4,132,680

CLASS 254

134.3 R 4,132,665
173 R 4,132,387
186 HC 4,132,389

CLASS 256

24 4,132,390
59 4,132,391

CLASS 260

4 AR 4,132,684
17 R 4,132,685
21 4,132,686
22 A 4,132,687
22 CB 4,132,688
23 AR 4,132,690
23 R 4,132,689
23 XA 4,132,691
29.2 EP 4,132,692
29.3 4,132,693
29.6 NR 4,132,695
29.6 R 4,132,694
31.6 4,132,696
32.8 EP 4,132,697
33.6 AQ 4,132,698
38 4,132,699
42 4,132,701
42.14 4,132,700
45.8 A 4,132,703
45.8 N 4,132,702
45.8 NT 4,132,704
307 FA 4,132,712
326.26 4,132,715
326.34 4,132,716
326.5 B 4,132,714
326.5 FL 4,132,713
343.21 4,132,717
348.15 4,132,718
348.48 4,132,719
348.61 4,132,720
365 4,132,721
396 N 4,132,722
404 4,132,723
448 AD 4,132,724
448.2 N 4,132,725
448.8 R 4,132,726
449.5 4,132,727
465 G 4,132,728
465.5 R 4,132,729
506 4,132,730
552 SC 4,132,736
578 4,132,737
586 R 4,132,738
605 S 4,132,739
606.5 B 4,132,740
655 4,132,741
668 A 4,132,742
669 R 4,132,743
677 A 4,132,744
683.2 4,132,745
836 4,132,681
857 PE 4,132,747
857 TW 4,132,746
873 4,132,748
876 R 4,132,749
887 4,132,750

CLASS 261

39 B 4,132,751
40 4,132,752

CLASS 264

25 4,132,753
39 4,132,754
174 4,132,756
210 F 4,132,757
553 4,132,755

CLASS 266

69 4,132,392
117 4,132,393
138 4,132,394

CLASS 267

64 R 4,132,395

CLASS 269

41 4,132,396
252 4,132,397

CLASS 271

9 4,132,398
221 4,132,400
245 4,132,401
263 4,132,402
277 4,132,403

CLASS 272

109 4,132,404
146 4,132,405

CLASS 273

1 R 4,132,406
54 B 4,132,407
84 R 4,132,408
4,132,409
100 4,132,410
119 R 4,132,411
251 4,132,412

CLASS 274

1 A 4,132,413
39 R 4,132,414

CLASS 277

12 4,132,415
18 4,132,416
27 4,132,417
47 4,132,399
91 4,132,418
96.2 4,132,419
160 4,132,420
166 4,132,421
212 FB 4,132,422

CLASS 280

5.3 4,132,423
11.23 4,132,425
11.3 4,132,424
11.37 E 4,132,426
19 4,132,427
278 4,132,428
647 4,132,429
673 4,132,430
691 4,132,431
711 4,132,432
712 4,132,433
744 4,132,434
772 4,132,435

CLASS 281

15 A 4,132,501

CLASS 282

27.5 4,132,436

CLASS 285

263 4,132,437

CLASS 290

53 4,132,901

CLASS 292

111 4,132,438
144 4,132,439
341.19 4,132,440

CLASS 294

19 R 4,132,441
25 4,132,442
97 4,132,443

CLASS 296

26 4,132,444
35 A 4,132,445
155 4,132,446

CLASS 297

367 4,132,447

CLASS 299

5 4,132,448

CLASS 300

4 4,132,449

CLASS 302

56 4,132,450

CLASS 303

116 4,132,451

CLASS 307

4,132,902
221 D 4,132,903
238 4,132,904
247 A 4,132,905
254 4,132,906
255 4,132,907
353 4,132,908
354 4,132,909

CLASS 308

3 R 4,132,452
238 4,132,453

CLASS 310

12 4,132,910
46 4,132,911
62 4,132,912
68 C 4,132,913
184 4,132,914

CLASS 312

27 4,132,454
97.1 4,132,455
223 4,132,456
284 4,132,457
305 4,132,458

CLASS 313

188 4,132,982
325 4,132,915
330 4,132,916
4,132,917
386 4,132,918
466 4,132,919
497 4,132,920

CLASS 315

39.51 4,132,921
73 4,132,922
151 4,132,923
208 4,132,925
241 P 4,132,926
371 4,132,927
377 4,132,928
408 4,132,929

CLASS 316

18 4,132,459

CLASS 318

138 4,132,930
346 4,132,933
382 4,132,934
480 4,132,935
482 4,132,936
568 4,132,937
4,132,938
627 4,132,939
640 4,132,940
663 4,132,941
732 4,132,931
795 4,132,932

CLASS 320

13 4,132,942

CLASS 324

6 4,132,943
30 R 4,132,944
58 C 4,132,945
73 R 4,132,946
77 A 4,132,947
158 F 4,132,948
224 4,132,949

CLASS 325

25 4,132,950
452 4,132,951
459 4,132,952
478 4,132,953

CLASS 328

165 4,132,954

CLASS 330

4.3 4,132,955
5 4,132,956
51 4,132,957
252 4,132,958
283 4,132,963

CLASS 331

94.5 C 4,132,959
94.5 F 4,132,962
94.5 H 4,132,960
94.5 PE 4,132,961
116 R 4,132,964

CLASS 333

73 R 4,132,965
80 R 4,132,966

CLASS 335

11 4,132,967
16 4,132,968

CLASS 336

94 4,132,969

CLASS 338

32 R	4,132,970
61	4,132,971
180	4,132,972

CLASS 339

119 R	4,132,460

CLASS 340

3 T	4,132,973
7 R	4,132,974
146.1 BA	4,132,975
146.3 AG	4,132,977
146.3 ED	4,132,978
146.3 Z	4,132,976
147 P	4,132,979
195	4,132,980
203	4,132,981
331	4,132,983
347 AD	4,132,985
373	4,132,986
506	4,132,987
552	4,132,988
779	4,132,924

CLASS 343

5 CM	4,132,989
7 A	4,132,990
13 R	4,132,991
100 PE	4,132,992
705	4,132,993
713	4,132,994
767	4,132,995

CLASS 350

96.20	4,132,461
117	4,132,462
184	4,132,463
336	4,132,984
351	4,132,464
357	4,132,465

CLASS 351

7	4,132,466

CLASS 352

172	4,132,467

CLASS 353

7	4,132,468
25	4,132,469

CLASS 354

1	4,132,470
86	4,132,471
155	4,132,472
203	4,132,473
234	4,132,474

CLASS 355

3 DD	4,132,476
3 R	4,132,475
11	4,132,477
71	4,132,478
	4,132,479
75	4,132,480

CLASS 356

325	4,132,481
350	4,132,482

CLASS 357

21	4,132,996
23	4,132,997
	4,132,998
30	4,132,999
46	4,133,000

CLASS 358

18	4,133,002
51	4,133,003
125	4,133,004
132	4,133,005
133	4,133,006
280	4,133,007
282	4,133,008

CLASS 360

9	4,133,009
68	4,133,010
78	4,133,011
90	4,133,012
92	4,133,013
96	4,133,014
109	4,133,015

CLASS 361

23	4,133,016
42	4,133,017
87	4,133,018
124	4,133,019
156	4,133,020
365	4,133,021
415	4,133,022

CLASS 362

11	4,133,023
101	4,133,024

CLASS 363

41	4,133,025
49	4,133,026

CLASS 364

119	4,133,027
200	4,133,028
	4,133,029
	4,133,030
412	4,133,031
424	4,133,032
	4,133,033
464	4,133,034
472	4,133,035
477	4,133,036
484	4,133,037
502	4,133,038
554	4,133,039
773	4,133,040
900	4,133,041
	4,133,042

CLASS 365

15	4,133,043
39	4,133,045
45	4,133,046
78	4,133,044
118	4,133,047
208	4,133,048
	4,133,049
213	4,133,050
222	4,133,051

CLASS 366

162	4,132,483
288	4,132,484

CLASS 400

208	4,132,485
213	4,132,486
479.1	4,132,487

CLASS 403

60	4,132,488
305	4,132,489
316	4,132,490

CLASS 404

68	4,132,491
119	4,132,492

CLASS 405

171	4,132,084
184	4,132,083
253	4,132,082
261	4,132,080
296	4,132,081
299	4,132,079

CLASS 407

53	4,132,493

CLASS 408

54	4,132,494
74	4,132,495
112	4,132,496
241 G	4,132,497

CLASS 415

2	4,132,499

CLASS 416

20 R	4,132,500
70 R	4,132,502
167	4,132,503

CLASS 417

68	4,132,504
207	4,132,505
218	4,132,506
234	4,132,507
462	4,132,508
475	4,132,509
534	4,132,510
540	4,132,511

CLASS 418

23	4,132,512
60	4,132,513
71	4,132,514
	4,132,515

CLASS 422

1	4,132,526

CLASS 423

27	4,132,758
161	4,132,759
167	4,132,760
242	4,132,761
272	4,132,762
350	4,132,763
415 A	4,132,764
484	4,132,765
579	4,132,766

CLASS 424

1	4,132,767
	4,132,768
	4,132,769
5	4,132,731
49	4,132,770
52	4,132,771
	4,132,772
57	4,132,773
60	4,132,774
89	4,132,775
101	4,132,776
119	4,132,777
121	4,132,778
122	4,132,779
127	4,132,780
181	4,132,781
195	4,132,782
200	4,132,783
	4,132,784
218	4,132,785
228	4,132,786
230	4,132,787
232	4,132,788
246	4,132,789
	4,132,790
250	4,132,791
	4,132,792
253	Re.29,875
257	4,132,794
266	4,132,795
267	4,132,796
270	4,132,797
	4,132,798
272	4,132,799
300	4,132,800
	4,132,801
303	4,132,802
312	4,132,805
316	4,132,803
317	4,132,804
357	4,132,806

CLASS 425

13	4,132,516
87	4,132,517
143	4,132,518
174.2	4,132,519
199	4,132,520
383	4,132,521

CLASS 426

2	4,132,807
	4,132,808
104	4,132,809
	4,132,810
111	4,132,811
250	4,132,793

CLASS 427

44	4,132,812
90	4,132,813
113	4,132,814
194	4,132,815
237	4,132,816
244	4,132,817
248 R	4,132,818
341	4,132,819

CLASS 428

65	4,132,820
151	4,132,821
196	4,132,822
215	4,132,823
220	4,132,824
311	4,132,825
314	4,132,826
329	4,132,827
366	4,132,828
411	4,132,829
450	4,132,830
458	4,132,831
462	4,132,832
481	4,132,833
511	4,132,834
522	4,132,835

CLASS 429

91	4,132,836
194	4,132,837

CLASS 521

27	4,132,682
50	4,132,838
106	4,132,683
159	4,132,839
167	4,132,840

CLASS 526

60	4,132,705
221	4,132,841

CLASS 528

33	4,132,842
45	4,132,843
89	4,132,706
273	4,132,707
499	4,132,844
	4,132,845

CLASS 536

17	4,132,846

CLASS 542

441	4,132,847

CLASS 544

28	4,132,848
	4,132,849
196	4,132,850
245	4,132,851

CLASS 546

7	4,132,708
63	4,132,710
89	4,132,709
286	4,132,711

CLASS 562

522	4,132,734
550	4,132,732
582	4,132,735
601	4,132,733

CLASSIFICATION OF DESIGNS

D2—	244	250,676
D4—	38	250,677
D6—	67	250,679
	75	250,680
	86	250,681
	125	250,682
	136	250,683
	146	250,684
		250,685
	183	250,686
	198	250,687
D7—	41	250,688
	94	250,689
	130	250,690
	189	250,691
D9—	253	250,692
D10—	39	250,693
		250,694
		250,695
	58	250,696
	70	250,697
	131	250,698
D11—	56	250,699
	126	250,700
D12—	58	250,701
	187	250,702
	209	250,703
	211	250,704
		250,705
D13—	5	250,706
D14—	1	250,707
	7	250,710
	12	250,708
		250,709
	33	250,711
	68	250,712
D15—	28	250,713
	29	250,714
D16—	14	250,678
D19—	91	250,715
D23—	57	250,716
	58	250,717
	97	250,718
D24—	17	250,719
D25—	25	250,720
		250,721
D28—	16	250,722
D34—	5 E	250,723
	5 L	250,724
	15 AM	250,725
	15 HH	250,726
		250,727
	15 JJ	250,728
D48—	20 A	250,730
		250,731
	20 D	250,729
D59—	2 B	250,733
D87—	3 F	250,734
	5 F	250,732
D92—	26	250,735

CLASSIFICATION OF PLANTS

P.—	7	4,360		20	4,361		41	4,362		68	4,363			4,364			

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

96—	114.5	T978,001	195—	63	T978,003	208—	8	T978,004	264—	85	T978,005	292—	41	T978,006	305—	39	T978,007
166—	311	T978,002															

GEOGRAPHICAL INDEX

OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 : 4,132,494
4 : 4,132,501
4,132,776
6 : 4,131,956
4,131,998
4,132,098
4,132,126
4,132,143
4,132,162
4,132,226
4,132,228
4,132,243
4,132,307
4,132,345
4,132,405
4,132,412
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4,132,655
4,132,758
4,132,784
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4,132,954
4,132,989
4,132,993
4,132,995
4,133,011
4,133,050
8 : 4,132,170
9 : 4,131,995
4,132,000
4,132,664
4,132,677
4,132,986
4,132,990
01 : 4,132,045
4,132,080
4,132,221
4,132,746
02 : 4,132,383
04 : 4,131,999
4,132,064
4,132,077
4,132,087
4,132,223
4,132,364
4,132,529
4,132,530
4,132,550
4,132,906
4,133,025
05 : 4,132,215
06 : 4,131,957
4,131,962
4,131,970
4,131,986
4,131,997
4,132,014
4,132,024
4,132,030
4,132,034
4,132,037
4,132,039
4,132,063
4,132,065
4,132,075
4,132,091
4,132,121
4,132,147
4,132,180
4,132,214
4,132,216
4,132,231
4,132,234
4,132,236
4,132,247
4,132,264
4,132,269
4,132,330
4,132,378
4,132,384
4,132,386
4,132,395
4,132,409
4,132,429
4,132,448
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4,132,544
4,132,557
4,132,582
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4,132,612
4,132,613
4,132,649
4,132,652
4,132,659
4,132,670
4,132,672
4,132,695
4,132,713
4,132,717
4,132,755
4,132,760
4,132,781
4,132,783
4,132,856
4,132,871
4,132,884
4,132,898
4,132,900
4,132,902
4,132,903
4,132,904
4,132,915
4,132,932
4,132,940
4,132,960
4,132,963
4,132,964
4,132,966
4,132,971
4,132,972
4,132,973
4,132,983
4,133,004
4,133,007
4,133,008
4,133,013
4,133,022
4,133,024
08 : 4,132,029
4,132,169
4,132,172
4,132,336
4,132,396
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PLANT PATENTS

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4,363

4,364

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